JUN 21 1927

If You Have Not Voted on Site for the A. Ph. A. Headquarters, Please Do So Now! Make Your Arrangements for the St. Louis Convention Early—the Coronado Hotel Will Be the Convention Headquarters—Week of August 22nd.

Vol. XVI, No. 6 JUNE, 1927

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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THE SEVENTY-FIFTH ANNUAL CONVENTION—THE DIAMOND ANNIVERSARY MEETING—WILL BE HELD IN ST. LOUIS DURING THE WEEK OF AUGUST 22nd.

The 1927 Meetings of the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy will also meet in St. Louis, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, see pages x, xii, xiv and xvi.

For Roster of Officers of Pharmaceutical Assoc.—State and National, see pages xviii, xix and xx.

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THE SEVENTY-FIFTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION IN ST. LOUIS.

THE Diamond Anniversary meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will open in St. Louis August 22nd, at Hotel Coronado. This means that the Section Officers should prepare for the programs of their respective sections. The titles of papers should be mailed to Secretary E. F. Kelly, 10 West Chase Street, Baltimore, Md., soon after July 1st, before if possible—so there will be no delay in preparing the Convention program.

Copies of papers may be sent to the office of the JOURNAL at any time by contributors—this may serve as a safeguard against loss.

The names of Section Officers, of Members of Committees, etc., will be found in the roster, printed in the Advertising Section.

The final ballot on the site for the A. PH. A. Headquarters was mailed to the members June 1st; hence, the selection will be known soon after the first of July. It is hoped that every member entitled to vote will exercise his privilege; the number of votes cast in the second ballot exceeded that of the first; let the final vote be even a more representative ballot.

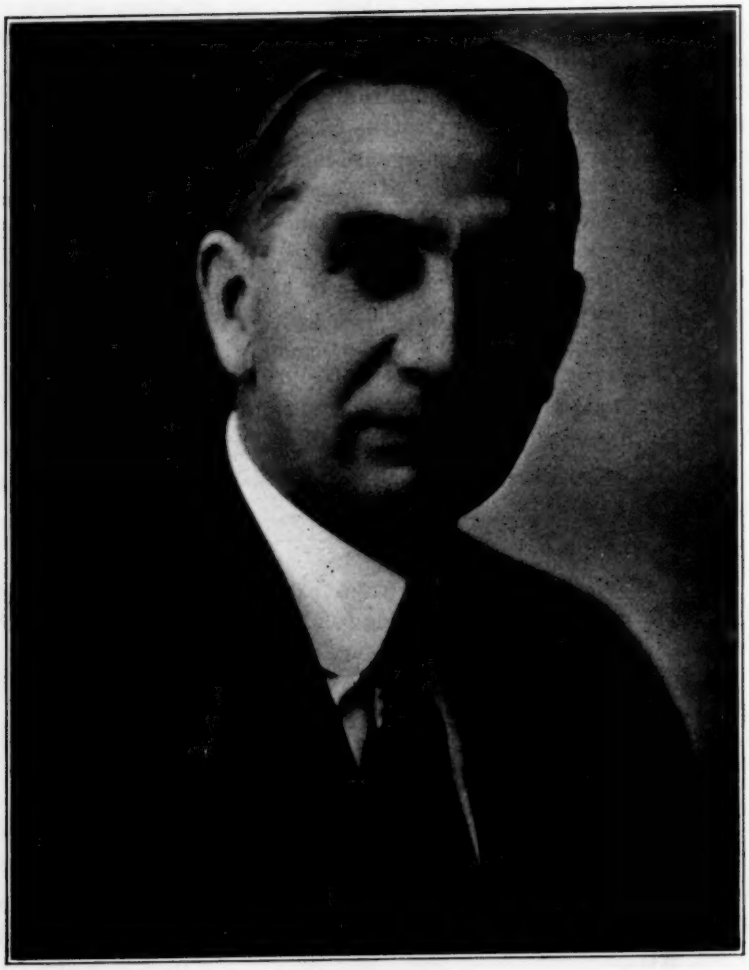
The sessions of the Plant Science Seminar will be held in St. Louis at Shaws Garden, August 16th–19th.

The National Conference on Pharmaceutical Research will be held at St. Louis—Hotel Coronado, June 24th–25th.

The Metric Association will convene at Lake Placid Club—June 24th–25th.

CONTRIBUTIONS TO THE MUSEUM AND LIBRARY OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Friends and members of the AMERICAN PHARMACEUTICAL ASSOCIATION who contemplate giving or bequeathing books, manuscripts and articles of historical value are respectfully asked to enclose them in boxes or packages and mark them "for the AMERICAN PHARMACEUTICAL ASSOCIATION" and forward them to the Historian, 10 West Chase Street, Baltimore. This is in accord with a vote of the Section on Historical Pharmacy, at the recent Philadelphia meeting. Due acknowledgment will be made. The time to give this matter attention is "as soon as possible"—otherwise, the request may be forgotten.—Thank you!



D. B. R. JOHNSON.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVI JUNE, 1927 No. 6

DAVID BYARS RAY JOHNSON.

David Byars Ray Johnson, President of the American Association of Colleges of Pharmacy, was born in Lyons, Kansas, on May 6, 1882. He was educated in the public schools of Rice County, until his removal to Reno County where he attended the Turon High School; coming to Oklahoma, in 1898, he entered the Northwestern State Normal School. He taught in the country schools and worked out an apprenticeship in pharmacy with William Antes at Carmen, Oklahoma. He matriculated at the University of Oklahoma in 1903, and later, at the University of Valparaiso, graduating from the latter institution in 1906. He then returned to Oklahoma and engaged in the drug business with Thomas Barrett at Carmen, having registered in both Oklahoma and Kansas. He quit the retail drug business to enter school again, dropping out in order to teach for two terms and to act as superintendent of schools at Waynoka, Okla. In 1914 he received the Bachelor of Arts degree in Education from the University of Valparaiso, after which he taught one term at Dickson, Tenn. and served as superintendent of the city schools. Returning to Oklahoma, he continued his studies and obtained the Master of Arts degree from the State University, in 1917. Professor Johnson was elected Acting Dean of the Oklahoma School of Pharmacy for one year, and then to the deanship, which position he has held since that time; he is also a member of the Publication Board of the University of Oklahoma.

Dean Johnson is a member of the Acacia fraternity, of Kiwanis Civic Club of Norman, a director of the Chamber of Commerce of that city; member of Kappa Delta Pi, honorary educational fraternity; of Oklahoma Pharmaceutical Association and of the AMERICAN PHARMACEUTICAL ASSOCIATION. He is a member of the Syllabus Committee of the American Association of Colleges of Pharmacy, and former Chairman of the Committee on Higher Educational Requirements of the latter Association. His work along this line has been helpful in the advancement of the college requirements. His endeavor to standardize the schools through the coöperation of the Boards of Pharmacy with the faculties is leading to some

very definite results; both of the organizations referred to have coöperative committees which are studying the problems connected therewith. The Dean has accomplished much in raising the standards of pharmacy in Oklahoma during his tenure of office from a grammar school requirement to a college graduation prerequisite for registration of pharmacists. This year he has been successful in obtaining a very beautiful building for the Oklahoma School of Pharmacy.

Professor Johnson and Miss Pearl Webb were married in 1910; two sons are now included in the family circle. The Dean is perhaps the most beloved and respected leader among the students of the campus of the University of Oklahoma, being a particular friend of the working student.

TESTIMONIAL FOR MEMBERS OF THE COMMITTEE ON NATIONAL FORMULARY.

President L. L. Walton in his presidential address stated that no financial reward would adequately compensate the members of the Committee on Revision of the National Formulary, and recommended that as an evidence expressive of

THE
American Pharmaceutical Association
hereby records its deep appreciation of the services of
as a Member of its Committee on the National Formulary which
so faithfully discharged the very important duty of preparing the
text of the Fifth Edition of the
National Formulary
Baltimore, Md.
September 27th, 1926
Theodore J. Bradley
President
E. F. Kelly
Secretary

the ASSOCIATION'S appreciation of the inestimable service rendered an engrossed testimonial, signed by the officers of the ASSOCIATION, be presented to each member of the Committee. The engraving herewith has been made from a photograph of a framed certificate, not so much as a matter of record but assurance that all members of the ASSOCIATION appreciate the altruistic services of the members of the N. F. Committee.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

ANTISEPTICS.

BECAUSE of apparent confusion at this time with respect to the meaning of the word "antiseptic," a general survey of the present status of this term will be of interest. It must be admitted, first, that such confusion does exist, and for very good reason. Like so many other English words, "antiseptic" has two meanings, according to the way in which it is used. It is variously defined as a substance which will kill pathogenic bacteria and also as a substance which merely prevents the growth of microörganisms.

The original use of the term was to designate a substance which would prevent putrefaction and decay in animal and vegetable matter. The word "antiseptic" is derived from the Greek and means, literally, "against putrefaction." Its somewhat broader present-day meaning is "against sepsis." In definitions given in the old dictionaries and encyclopedias, from 1819 to 1868, the ability to arrest putrefaction is the only meaning given to this word. At the time of Lister's epochal work, this word took on an additional meaning and germicides used in antiseptic surgery advocated by him were called "antiseptics." From this time on, dictionaries and encyclopedias give two meanings to this word, namely, (1) a substance which will prevent putrefaction and fermentation in animal and vegetable matter and, (2) a substance used to destroy pathogenic microörganisms. The American Encyclopedia (1873) gives these two definitions, giving heating or drying or cold, used in preserving food or organic matter, as antiseptic action in one sense, and then defines the term again as a germicide for use in surgery. As an example of antiseptic for surgical use, carbolic acid is mentioned and the dilutions used by Lister, 1–20 to 1–40, are given. These dilutions are germicidal.

Dictionaries for the laymen and medical profession alike have continued to the present time to give these two separate and distinct meanings for the word "antiseptic." In the medical literature since Lister's work on antiseptic surgery, killing agents, such as carbolic acid, mercuric chloride, etc., have been referred to as antiseptics, and the medical profession to-day continues to use the term in this way. One may rightfully wonder, then, why there should be confusion with respect to the interpretation of this term. There is a reason and the blame for it rests with American bacteriologists and the authors of American textbooks on bacteriology. For some unknown reason, American bacteriologists have chosen to recognize only one of the two definitions of this word and in their teaching they give only the inhibitory meaning. This interpretation has, therefore, a technical meaning peculiar to bacteriology and through teachers of this subject this meaning has been passed on to students in schools throughout the country. In this connection, bacteriologists themselves are at fault in telling only a half-truth. Defenders of this interpretation are also guilty of the same offense. Some have gone so far as to quote only half of the definition of the word as given in our standard medical and lay dictionaries and to give as examples of antiseptics only those substances used as food preservatives. This is obviously unfair and is a very defi-

nite source of misinformation which has caused confusion in the minds of many as to the correct interpretation of this word.

In a recent paper on the methods of testing antiseptics[1] the following definition is given: "Antiseptics are substances which, when applied to microörganisms, will render them innocuous either by actually killing them or preventing their growth according to the character of the preparation or the method of application." This definition includes both meanings and is hardly open to misinterpretation.

It is evident that an inhibitory substance may be used in a manner in which a long period of contact with the infective organism is assured and by preventing the growth of these microörganisms deserves to be called an antiseptic. Such preparations are of value in treating certain types of injuries and in counteracting infections. Antiseptic ointments and salves, surgical dressings saturated with inhibitory agent, antiseptic dyes which remain active in the tissues for a long time, all are of value in rendering infective organisms innocuous and they are antiseptics. However, when used in a manner in which only short-time application is had, such as ordinary liquid antiseptics as used on cuts, abrasions, etc., and mouthwashes, toothpastes, sprays, gargles, douches, soaps, etc., actual killing of the organisms must take place if the preparation is to render them innocuous and, consequently, they must be germicidal in order to rightfully be called "antiseptic." However, such preparations which are of themselves antiseptic may, when diluted, cease to be germicidal.

The layman does not make this distinction in his use of this word. To the layman an antiseptic is a substance which will kill "germs" and that is the only use he has for it. When he buys an antiseptic he does so for the purpose of using it to kill pathogenic bacteria. Most of the medical profession are of the same opinion when they use antiseptics in a practical way. One surgeon of international reputation is known to have said that an antiseptic is of no use to him in his practice if it does not kill pathogenic bacteria. Another surgeon of high rank has said that to him the only difference between a disinfectant and an antiseptic is that a disinfectant is used to kill bacteria on inanimate objects, whereas an antiseptic is used to kill bacteria on the human and animal body. It is evident, then, that the laity and the medical profession also expect antiseptics as ordinarily used to kill bacteria. It is for this reason that the Bureau of Chemistry has taken its present stand relative to antiseptics. A judicial decision made under the Food and Drugs Act states "Language used in the label is to be given the meaning ordinarily conveyed by it to those to whom it was addressed." It is evident that in enforcing the Food and Drugs Act the meaning conveyed by the word "antiseptic" to the users of these preparations is the basis on which the Government is acting in protecting the public from mislabeled products. The attitude of the Bureau of Chemistry is not only reasonable, but it is backed by current definitions in standard lay and medical dictionaries. The Bureau is to be commended for the good work it has done and is doing in this field. Reputable drug manufacturers have shown a coöperative spirit in this work and apparently welcome a project which raises the standard of excellence in products of this nature.—G. F. R.

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[1] George F. Reddish, "Methods of Testing Antiseptics," *Drug Markets*, Vol. 20, No. 9, May 3, 1927, p. 495.

"NEW AND NONOFFICIAL REMEDIES."

WHILE, probably, the greater number of our readers are informed relative to the purpose of the publication of "New and Nonofficial Remedies" it is in order to state briefly the reason for reprinting the descriptions and definitions in the JOURNAL.[1] The Pharmacopœia and the National Formulary do not include drugs and preparations of secret composition or those controlled by proprietary rights. To provide standards as far as practicable for products of the latter classes and for certain other remedial agents not recognized by the official standards, the American Medical Association established the Council on Pharmacy and Chemistry. Such preparations must comply with rules and regulations formulated by the Council, which is made up of physicians, chemists and pharmacists.

While the welfare of the physician and his patient is a prime object of the Council, pharmacists should be informed relative to the preparations which are given recognition by the Council, and this is the aim and purpose in reprinting the reports in the JOURNAL A. PH. A., after they have been published in the *Journal A. M. A.* In other words, the former seeks to render service to pharmacists. Approval has been given by the Secretary of the Council and the *Journal A. M. A.* for re-publication of the reports, as stated.

It is hoped that pharmacists will use this service as an opportunity for coöperation by verifying the descriptions, tests, etc., or correcting inaccuracies should any appear. The correctness of the descriptions, standards and tests are of direct interest to pharmacists, and the purpose of THIS JOURNAL *is to give information and to render service*, and this, as stated, constitutes the reason for the inclusion of the reports.—E. G. E.

ORAL ADMINISTRATION OF INSULIN.

M. Elzas states that Lasch and Brugel of Vienna had stated that it was possible to give insulin by the mouth by mixing it with 0.5 Gm. of saponin dissolved in 20 to 30 cc. of normal saline solution. Acting on their suggestion the author determined the blood sugar in a diabetic patient 1, 2, 3 and 4 hours after subcutaneous injection of insulin, and then gave insulin by the mouth in a solution of saponin in distilled water, in distilled water without saponin, and in the solution of saponin in normal saline as recommended by Lasch and Brugel. During these tests the diet remained unchanged and no change was made in the interval between the administration of insulin and the taking of food. Of the two injections which the patient received daily only the first was replaced on some days by oral administration of the drug. The result of the tests was that not only was the oral administration of insulin much more unpleasant than subcutaneous injections owing to the burning sensation it caused in the mouth, but there was a progressive rise in the blood sugar instead of the fall observed after subcutaneous injection. It is concluded that oral administration of insulin is valueless. (*Nederland. Tijdschr. Geneeskunde*, through *B. M. J. Epit.*, 1, 2 (1927), p. 1650 (1926).)

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[1] See "Editorial Notes" in this issue of the JOURNAL.

SCIENTIFIC SECTION

PHYSIOLOGICAL POTENCY OF IMPORTED ERGOT OF RYE.

BY GEORGIANA SIMMONS GITTINGER, M.A. AND JAMES C. MUNCH, PH.D.

The chief source of ergot of rye offered for entry at the port of New York during the last three years is Spain, although smaller quantities have been offered from Portugal, Russia and Poland. About 60,000 pounds are imported annually from Vigo, the chief Spanish shipping center. In addition to the shipments coming directly from their countries of origin, many are consulated from foreign ports, as Antwerp, Hamburg or London.

Samples from 69 shipments, representing 1100 bags of ergot of rye, have been assayed by the cockscomb method adopted as the official method of assay in U. S. P. X. (Described under "Ergota," page 133, Pharmacopœia of the United States, Tenth Decennial Revision, 1925.) Forty-two, or 60 per cent, were found to be as strong as or stronger than, the U. S. P. X Standard Fluidextract of Ergot prepared and distributed by the Bureau of Chemistry.

Five samples were reported as "wormy" or "containing mites." However, fluidextracts made from three of these were found to be more potent than the Standard Fluidextract. The other two samples had the same potency.

Ergots from Poland, with one exception, have come from Warsaw: three of the five samples tested were sub-standard. Six Portuguese samples from Oporto and Lisbon met the physiological requirement. Only two of the nine samples of known Russian origin were as strong as the U. S. P. Standard. On the other hand, 26 of the 27 samples of Spanish origin were equal to or stronger than the U. S. P. requirement.

Twenty-two consignments consulated from Antwerp, Hamburg, London and Rotterdam, for which no information regarding country of origin was avail-

Country of origin.	Consulate.	Physiological potency. More than 100%.	100%.	Less than 100%.	Sub-total.	Total.
Poland	Antwerp	1	..	..	1	..
	Warsaw	..	1	3	4	5
Portugal	Lisbon	1	3	..	4	..
	Oporto	2	..	..	2	6
Russia	Hamburg	..	2	4	6	..
	Moscow	..	..	3	3	9
Spain	Antwerp	4	1	..	5	..
	Barcelona	1	1	1	3	..
	Hamburg	7	2	..	9	..
	London	2	..	..	2	..
	Vigo	4	4	..	8	27
Unknown	Antwerp	..	1	..	1	..
	Hamburg	..	3	11	14	..
	London	..	..	5	5	..
	Rotterdam	1	1	..	2	22
		23	19	27	69	69

able, were tested. Of these 6 were equal to or more active than the standard, and 16 were sub-standard. Perhaps some indication of country of origin may be obtained by comparison with the potencies of authenticated samples of ergot during the same season.

The Pharmacopœia states that ergot "deteriorates with age, and should not be kept longer than one year." It has been reported that climate, time of harvesting and the conditions of storage of crude ergot directly affect the quality. It may be that climatic conditions have been less favorable for Russian ergot than for Spanish. It is possible also that the samples from Russia are more than one year old.

PHARMACOLOGICAL LABORATORY,
BUREAU OF CHEMISTRY,
U. S. DEPARTMENT OF AGRICULTURE.

THE ASSAY OF ERGOT BY THE COCKSCOMB METHOD.

BY GEORGIANA SIMMONS GITTINGER, M.A. AND JAMES C. MUNCH, PH.D.

The method of assaying ergot, officially adopted in U. S. P. X is as follows:

"Ergot, in the form of the fluidextract, administered by intramuscular injection to single-comb, white Leghorn cocks, in doses not exceeding 0.5 cc. for each kilogram of body weight of cock, produces a darkening of the comb, corresponding in intensity to that caused by the same dose of a standard fluidextract of ergot, * * * * *.

"Assay—Use single-comb, white Leghorn cocks, which are less than eighteen months of age, and weigh approximately 2 kilograms. Injections are made deeply into the breast muscles, and the effects are observed within one hour to one and a half hours after the administration of the drug. The same cock must not be used for testing purposes at shorter intervals than two weeks." (U. S. P. X, Ergota, page 133.)

The fluidextract of ergot is the form most commonly used in medicine. The solid extract, the powdered extract and various ergot pastes are unsuitable for assay as such, and are accordingly converted into fluidextracts for assay purposes. One part by weight of the paste or powder is dissolved in 3 parts of 50% ethyl alcohol to make a 1:4 solution.

A few experiments showed the same reaction of the comb whether the fluidextract was injected into the breast mucles or into the leg muscles. It is more practical to use the breast muscles, and the occasional development of local abscesses there is less serious than on the leg.

Various types of chickens were tested for possible substitution for the required white Leghorn cocks. Four rose double-comb white Leghorn cocks of suitable age, and weighing from 1900 Gm. to 2200 Gm. were tested at doses of 0.5 cc. and 1.0 cc. of U. S. P. X Standard per Kg. body weight. No effect was produced on either comb or wattles.

A series of hens was tested against a series of cocks of comparable weights; 90% of the cocks gave a satisfactory reaction, but the hens exhibited only slight blanching, or no effect whatever. Table I.

Breeds of cocks other than white Leghorns were tested also, with generally unfavorable results:

Brown Leghorns were more nearly satisfactory, but their combs returned to normal too slowly. They were also subject to loss of weight. Table II A.

Plymouth Rocks were tested, but too large a percentage of them failed to clear their combs within the specified two weeks (combs of white Leghorns usually clear in 24 to 48 hours); in addition, the birds at the proper age are too heavy. Table II B.

Rhode Island Reds of the right age which we used were too light in weight; and besides, their combs failed to clear within the two-week period. Table II C.

A code of numbers has been developed in this laboratory to denote the degree of darkening of the comb after injections. A satisfactory bluing of both lobe and tips of the comb, that meets standard requirments is recorded as 22. The figure

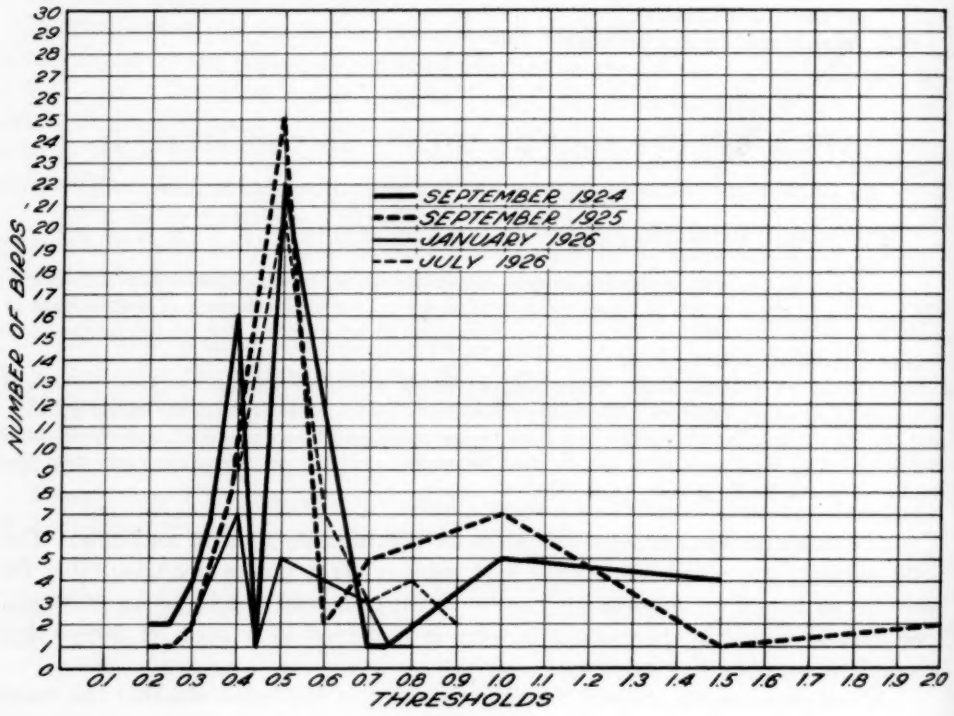

Chart I.

20 indicates that only the lobe is blue, and 21 that the lobe and first tip are the parts affected. A minimal effect is registered as 12 for lobe plus tips, 11 for lobe and one tip, 10 for lobe alone. The maximal effect, from too large a dose, is indicated by 33 for the whole comb, 32 and 31 for lobe and few or one tips, and 30 for lobe alone. This 30 is seldom encountered. Blanching of the comb in addition to the bluing is also recorded, and due consideration is given it in determining the potency of the sample being assayed.

Though the Pharmacopœia requires that "doses not exceeding 0.5 cc. for each Kg. of body weight of cock," shall produce the standard darkening of the comb, it has been found that the threshold dose—that dose which produces the just satisfactory bluing neither more nor less—varies with individual birds.

It is the practice in this laboratory to determine the threshold of a bird before using for assay purposes. The Standard Fluidextract of Ergot is used, and as many injections are made as may be necessary to determine the dose per Kg. which will give a satisfactory bluing of the comb. The majority of our birds have a threshold at 0.5 cc. per Kg.; but in our experiments we have had thresholds as high as 2.0 cc. per Kg. and as low as 0.2 cc. per Kg.

In four groups of birds obtained at different seasons, we found the variations in the threshold noted in Table III, and Graph I. It will be seen that in each group the highest percentage lies either at 0.5 cc. per Kg. or between 0.4 cc. and 0.5 cc. For the total of the several groups, the highest percentage of the whole 190 birds lies at 0.5 cc. per Kg. Table IV, Graph II.

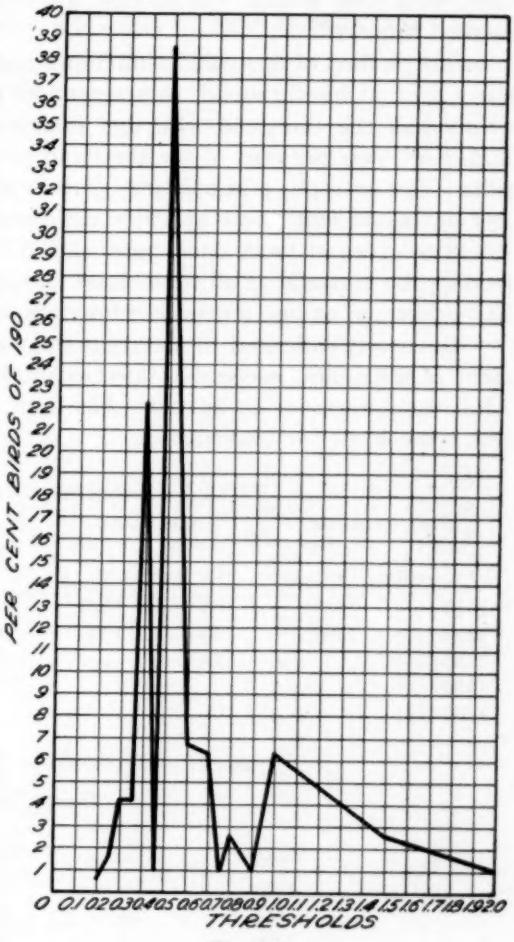

Chart II.

When the threshold has been determined for a bird, the proper corrections are made in the final report on samples of Ergot assayed on him.

Thresholds may vary with age, sensitization or habituation to the drug. Therefore, at regular intervals the birds are reinjected at their previously determined threshold with doses of the U. S. P. X standard to verify that threshold. Very few alterations, whether more or less, have ever been found in it.

The most common variation is an increase in the threshold dose; the bird, perhaps, becoming habituated to the drug. However, when a threshold becomes increasingly higher the bird is discarded.

Birds are also discarded when their combs continually fail to return to normal within the rest period of two weeks. Consideration is always given as to whether the bird has received a very high dose; recovery in such case, being naturally more retarded. Slower recovery is also noticeable after several months' constant use.

Observations of the effect of the drug are made from one hour to one and a half hours after injection. No change in darkening has been noted even after two-, or four-hour intervals. Though Edmunds finds that the color begins to fade after 2 hours,[1] our birds rarely clear their combs entirely under 24 hours. In

[1] C. W. Edmunds, *Hygienic Lab. Bull.*, No. 76, p. 25.

some cases, depending on the amount of the dose, they require 48 hours to return to normal.

The Pharmacopœia requires a two weeks' rest period. Edmunds reports using his birds after two to three days' interval, with no harmful effects. From results obtained in some special investigations we feel that a one-week interval is adequate for most birds; 10 days has been our shortest period, though in one experiment we used a bird which had made a speedy recovery, after four days, with good results. In no case was the bird injured or the accuracy of the method impaired.

Our method of assaying an unknown sample is to select three birds, giving to one a dose at his threshold, to a second at twice the threshold, and to the third at one-half the threshold. Further injections are then made on fresh birds at higher or lower per cent of the threshold as may be indicated by the previous results. For example, a sample may give no reaction at half, none at the threshold, and an insufficient effect at twice the threshold. Hence, the second injections would be given at twice once more, and at five times. However, should the first readings be maximal at all three doses, reinjections on fresh birds are made at one-half again and at one fourth and lower as may be indicated.

In case it is desired to ascertain the potency of a sample at a higher refinement of difference, successive injections are given of doses more closely spaced. After the potency of an unknown has been determined, we frequently inject several other birds for confirmation.

TABLE I.—INFLUENCE OF SEX ON REACTION.

Dose: 0.3 cc./Kg.				0.35 cc./Kg.				0.4 cc./Kg.				0.45 cc./Kg.			
Cock.		Hen.		Cock.		Hen.		Cock.		Hen.		Cock.		Hen.	
Wt.	Reaction.	Wt.	Reaction.	Wt.	Reaction.	Wt.	Reaction.	Wt.	Reaction.	Wt.	Reaction.	Wt.	Reaction.	Wt	Reaction.
1540	+	1310	−	1630	+	1510	−	1110	−	1060	−	..	—	1150	−
1280	+	1200	−	1360	+	1330	−	1050	+	920	−	..	—	1170	−
1630	+	....	..	1280	+	....	..	....	..	....	..	..	..	....	..
1350	+	....	..	....	..	....	..	....	..	....	..	..	..	....	..
1200	+	....	..	....	..	....	..	....	..	....	..	..	..	....	..

TABLE II.—INFLUENCE OF BREED ON REACTION.

A. Brown Leghorns.

Cock no.	Weight.	Days since previous injection.	Dose.	Conditions of comb. On injection.	Final.
2291	1850	..	0.5	....	21
	1555	21	0.5	Blanched	21
	1400	11	0.5	....	33
	1305	18	0.3	Blanched	22
2463	1480	..	0.5	....	22
	1520	18	0.5	....	33

B. Plymouth Rocks.

1919	3470	..	0.5	..	22
	3470	21	0.4	21	32
	3220	18	0.2	11	22
4186	3460	..	0.5	..	32
	2880	21	0.3	12	33
	2860	18	0.15	..	02

C. Rhode Island Reds.

2447	1250	..	0.25	..	32
	1365	13	0.125	10	20
	1550	13	0.15	..	33
	1500	25	0.13	11	21
3290	1640	..	1.0	..	33
	1435	13	0.5	10	33
	1520	25	0.3	11	32

TABLE III.—VARIATIONS IN THRESHOLD FOR 4 GROUPS OF WHITE LEGHORN COCKS.

Dose cc./Kg.	Number of birds. Sept. 1924.	Sept. 1925.	Jan. 1926.	July 1926.
2.0	..	2	..	..
1.5	4	1	..	..
1.0	5	7	..	..
0.9	..	..	..	2
0.8	..	..	1	4
0.75	1	..	1	..
0.7	1	5	3	3
0.6	..	2	4	7
0.5	22	25	5	21
0.45	1	..	1	..
0.4	16	10	7	9
0.35	8	..	..	..
0.3	4	2	2	..
0.25	2	1	..	..
0.2	..	1	..	..
	60% at 0.4–0.5	62% at 0.4–0.5	54% at 0.4–0.5	65% at 0.4–0.5

TABLE IV.—PER CENT OF EACH THRESHOLD DOSE ON TOTAL OF 4 GROUPS OF BIRDS.

Number of birds.	Dose cc./Kg.	% of total.	Number of birds.	Dose cc./Kg.	% of total.
2	2.0	1.0	73	0.5	38.4
5	1.5	2.6	2	0.45	1.0
12	1.0	6.3	42	0.4	22.1
2	0.9	1.0	8	0.35	4.2
5	0.8	2.6	8	0.3	4.2
2	0.75	1.0	3	0.25	1.6
12	0.7	6.3	1	0.2	0.5
13	0.6	6.8			
			190		100.0

SUMMARY.

1. Ergot preparations should be converted into fluidextracts for assay.

2. Single-comb white Leghorn cocks have been found the most satisfactory breed of bird for assay purposes.

3. Variations in sensitivity to ergot are found in birds used for assay. Therefore all birds should be standardized before being used for the assay of unknown samples.

4. Durations of the effect of injection of the drug should be noted. Experiments under way suggest the possibility that the prescribed rest period of two weeks may safely be reduced to one week.

5. A sufficient number of assays should be made on any unknown sample to definitely determine its potency.

CONCLUSION.

By careful attention to details, ergot and its preparations may be satisfactorily assayed by the cockscomb method outlined in U. S. P. X.

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THE COLORIMETRIC ASSAY OF DIGITALIS.*

BY L. W. ROWE.

Several years have passed since Knudson and Dresbach (1) suggested the use of the Baljet (2) reaction for the colorimetric assay of digitalis preparations. Their work on about 30 preparations of digitalis indicates that the colorimetric method is about as accurate as the Hatcher cat method (3) and checks with the cat method very closely. Only two of the preparations were tested by the U. S. P. frog method. Kruse (4) has reported on the subject and finds the colorimetric method suitable for the determination of total activity but not for activity developed after absorption. He believes that the frog method is most suitable for the standardization of digitalis.

Although the M. L. D. frog heart method of Houghton (5) has been successfully used in our laboratory for standardizing digitalis preparations for more than thirty years, it seemed advisable to try out the colorimetric method because if it is sufficiently accurate it would reduce the time and expense of each assay.

Accordingly experiments were begun and direct comparisons were made between results obtained using the technique of Knudson with a Klett constant light colorimeter and those obtained at about the same time with the M. L. D. frog method. The first series was based on the Hatcher standard since it was known from previous comparisons that 8 heart tonic units of the frog test were about equal to 1 cat unit.

TABLE I.

Preparation and number.	Color test.	Frog test.	Color error.
Tr. Digitalis 768526	200%	105%	48% high
Tr. Digitalis 765576	220%	90%	60% high
Tr. Digitalis 766998	210%	90%	57% high
Tr. Digitalis 157585	200%	100%	50% high
Tr. Digitalis 767577	240%	110%	54% high
Tr. Digitalis 767577 (fortified)	250%	150%	40% high

In this series results were calculated from readings around 10 against 20 for the standard and also in some cases using 2 cc. of the sample instead of the usual 5 cc. It was found that results were particularly high by the color method when 2, 3 and 4 cc. of samples of tinctures were used with proportionate amounts of purifying reagents so this feature was abandoned.

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* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

The artificial standard suggested by Knudson (a solution of pure potassium dichromate 3.44 Gm. per liter) was tried out very thoroughly and was discarded because the quality of color was appreciably different from that developed in the purified digitalis solutions and was consequently more difficult to match.

In the second series of tests the Knudson ouabain standard (0.266 mg. per 5 cc.) was used against our bio-assay standard established many years ago of 65 H.T.U. per Gm. of digitalis leaves and results were more comparable though quite erratic.

TABLE II.

Preparation and number.	Color test.	Frog test.	Color error.
F. E. Digitalis 158274	130%	120%	10% high
Tr. Digitalis 770221,	130%	150%	15% low
Digitalis Sol. Experiment	87%	150%	72% low
Tr. Digitalis 761298	136%	110%	25% high
Tr. Digitalis 763831	140%	130%	7% high
Tr. Digitalis 766793	185%	180%	3% high
Tr. Digitalis 768303	100%	165%	65% low
Tr. Digitalis 157036	162%	165%	2% low
Tr. Digitalis 768138	62%	110%	77% low
Tr. Digitalis from drug	154%	200%	30% low
Tr. Digitalis 764044 (with)	140%	110%	20% high
Tr. Digitalis 764044 (without)	120%	110%	10% high
Tr. Digitalis Composite (five)	119%	129%	8% low
Tr. Digitalis Composite (five)	130%	126%	3% high
Tr. Digitalis 158542	106%	100%	6% high
Tr. Digitalis 772170	187%	165%	12% high
Digitalone Experiment	123%	110%	12% high
Tr. Digitalis 158545	106%	100%	6% high
Digitalin 301470	46%	44%	4% high
Tr. Digitalis C-71	560%	500%	10% high
F. E. Digitalis 131845	118%	88%	25% high
F. E. Digitalis 772944	157%	90%	42% high
Digitalone Experiment	154%	150%	3% high

In this second series the average colorimetric test error was lower largely because of the inconsistency of the two standards. The color standard of 0.266 mg. ouabain per 5 cc. equivalent to the Hatcher cat method standard was used against the M. L. D. frog method standard although it was known from previous comparisons of the two bio-assay methods and standards that the frog method standard was about 25% lower than the Hatcher standard. The results in this series were erratic as shown by the fact that the extremes were from 77% low to 42% high. The average variation was 20% while if the 5 results where the variation was 30% or over are left out the average variation is only 10% which would be very good considering the experimental error of the bio-assay method if it were not for the known discrepancy between the two standards. Variations in the technique were used in this series including the use of the potassium dichromate standard which was found unsatisfactory.

In the third series the technique was standardized to the point where comparative readings of the standard and sample were always made 20 minutes after the color of the final mixture started to develop since this was found to be the better procedure. The color will change appreciably after 20 minutes but the

change between the standard and sample is not as nearly proportional as it is up to 20 minutes. Also in this series each assay was checked once or twice by diluting the sample on the basis of the first assay and testing the dilutions until one was found which averaged between 19 and 21 for three readings with the standard set at 20. Work on a suitable standard was continued by using solutions of digitalin and digitoxin. It was found that a particular lot of German digitalin which was 50% of standard by the frog method was equal to the 1 to 25,000 solution of standard ouabain when dissolved 1 part to 2500 in distilled water. A standard digitalin could therefore be diluted 1 to 5000 and ouabain would only be 5 times as active as digitalin by the color method. By the frog method the ratio is 100 to 1, so this indicates that the digitalin is unsuitable as a color standard but because of its solubility in water and its highly purified condition it was used in this series. Digitoxin, the chief active principle of digitalis leaves was also used as a standard. Two different lots were used and they were found to be quite inconsistent by the frog and color methods. One sample No. 45,125 was found to contain 11,000 H.T.U. of activity per Gm. by the frog test and was consequently eleven times as active as the digitalin with which it was compared. By the color test a 1 to 16,000 dilution was equal to the 1 to 2500 dilution of digitalin showing that it was but 6.4 times as active. Another sample No. 45,805 was found to contain 9000 H.T.U. per Gm. and was thus nine times as active as the digitalin. By the color test a 1 to 22,500 dilution was equal to the 1 to 2500 dilution of digitalin being thus nine times as active and checking with the frog test. Digitoxin should be about 5 times as active as standard digitalin or 10 times as active as the 50% digitalin which was being used. The insolubility of digitoxin in water, the inconsistency of different samples in activity by the same and by different methods, and the fact that it is but one of the active principles of digitalis leaves (even though the most important) are sufficient reasons for its being unsuitable as a standard.

TABLE III.

Preparation and number.		Standard.	Color test.	Frog test.	Color error.
Tr. Digitalis Rx	12284	Digitalin	220%	180%	18% high
Tr. Digitalis	776431	Digitalin	200%	150%	25% high
F. E. Digitalis	766757 (Stock)	Digitalin	115%	110%	4% high
Digitalin Tabs.	777570	Digitalin	125%	75%	40% high
Tr. Digitalis	776113	Digitalin	200%	150%	25% high
Tr. Digitalis	777274	Digitalin	200%	150%	25% high
S. E. Digitalis	778267	Digitalin	135%	165%	15% low
Tr. Digitalis	159949	Digitalin	220%	175%	16% high
Digitalin	304090	Digitalin	70%	35%	50% high
Tr. Digitalis	773516	Digitalin	220%	150%	32% high
Tr. Digitalis	777275	Digitalin	200%	150%	25% high
Tr. Digitalis	777699	Digitalin	240%	165%	31% high
Tr. Digitalis	2748123	Digitalin	200%	165%	18% high
Digitalone	075566	Digitalin	160%	140%	12% high
Digitalin	49929	Digitalin	30%	35%	16% low
Digitalin	49921	Tr. Stroph.	40%	30%	25% high
F. E. Digitalis	777259	Digitalin	135%	95%	30% high
Tr. Digitalis	776558	Digitalin	200%	200%	.....
Tr. Digitalis	12630	Digitalin	250%	225%	10% high

Table III gives the comparative results on this series showing that with the lower standard the results by the color method are invariably high.

The average variation on these 19 tests was 23% including the two where the color test was low. If these two are excluded the average color test error is 24% high or nearly one fourth. It was decided on the basis of this series that digitalin was not a satisfactory standard, though the fact that it was soluble in water, could be used in so dilute a solution that it did not need to be purified and was more representative of complete digitalis activity than any one principle such as digitoxin, appealed strongly in its favor.

The fourth and final series of tests of samples of regular manufactured lots was more extensive than any others and differed from the third series only in the standard used. A carefully standardized tincture of strophanthus (5%, U. S. P. 1890) which had been used as the standard in testing by the frog method was care-

TABLE IV.

Preparation and number.		Standard.	Color test.	Frog test.	Color error.
Digitalone	078634	Tr. Strophanthus	250%	125%	50% high
Tr. Digitalis	779837	Tr. Strophanthus	225%	100%	56% high
Digitalin	20786	Tr. Strophanthus	80%	40%	50% high
Tr. Digitalis	779788	Tr. Strophanthus	200%	150%	25% high
Digitalin	305382	Tr. Strophanthus	40%	30%	25% high
F. E. Digitalis	777259	Tr. Strophanthus	200%	135%	33% high
Tr. Digitalis	160483	Tr. Strophanthus	175%	140%	20% high
Tr. Digitalis	780725	Tr. Strophanthus	200%	120%	40% high
S. E. Digitalis	781724	Tr. Strophanthus	175%	155%	11% high
F. E. Digitalis	133524	Tr. Strophanthus	160%	150%	6% high
Tr. Digitalis	160482	Tr. Strophanthus	250%	175%	30% high
Tr. Digitalis	2709495	Tr. Strophanthus	250%	100%	60% high
Tr. Digitalis	781918	Tr. Strophanthus	220%	150%	32% high
Digitalone	079076	Tr. Strophanthus	120%	70%	40% high
F. E. Digitalis	160569	Tr. Strophanthus	235%	165%	30% high
Digitalin "A"	.....	Tr. Strophanthus	110%	65%	40% high
Digitalone	079076	Tr. Strophanthus	330%	120%	64% high
Tr. Digitalis	781277–8	Tr. Strophanthus	175%	120%	31% high
Tr. Digitalis	779652	Tr. Strophanthus	150%	110%	27% high
Digitalin "B"	.....	Tr. Strophanthus	90%	40%	55% high
Tr. Digitalis	160481	Tr. Strophanthus	175%	165%	5% high
F. E. Digitalis	780569	Tr. Strophanthus	180%	120%	33% high
Tr. Digitalis	4969	Tr. Strophanthus	160%	135%	16% high
Tr. Digitalis	781829	Tr. Strophanthus	165%	120%	27% high
Tr. Digitalis	783423	Tr. Strophanthus	220%	155%	30% high
S. E. Digitalis	783370	Tr. Strophanthus	220%	200%	10% high
S. E. Digitalis	783718	Tr. Strophanthus	160%	145%	10% high
Tr. Digitalis	161033	Tr. Strophanthus	135%	120%	11% high
Tr. Digitalis Crude drug (stab.)		Tr. Strophanthus	220%	165%	25% high
Digitalin "C"	.....	Tr. Strophanthus	100%	38%	62% high
Tr. Digitalis	161028	Tr. Strophanthus	220%	110%	50% high
Digitalone	079836	Tr. Strophanthus	330%	150%	55% high
Digitalis leaves	784345	Tr. Strophanthus	230%	120%	48% high
Dig. Powd.	783718	Tr. Strophanthus	250%	220%	12% high
Tr. Digitalis	782166	Tr. Strophanthus	300%	110%	63% high
P. E. Digitalis	2760232	Tr. Strophanthus	135%	100%	26% high
Tr. Digitalis Crude drug		Tr. Strophanthus	280%	190%	32% high

fully compared with the 1 to 25,000 solution of U. S. P. ouabain and the 1 to 2500 solution of 50% digitalin and found to be equal to them when diluted 1 to 70. This Tr. Strophanthus 1 to 70 was used as the standard without purification in this entire series.

The average color test variation in this series of 37 tests was 32% high with the extremes ranging from 5% to 64%. If the average variation was much more uniform a correction factor could be used but there are about as many samples that are 5% to 20% high as there are that are 45% to 60% high. No further variations in the technique suggested themselves so it was decided that the total activity and that absorbed by the frog in the frog method might not be proportional in different samples.

The accuracy of the color method was further tested, however, by making up dilutions of various preparations that had previously been tested by both methods and the dilutions of which were unknown to the technician making the test. These results were also erratic as shown by the following short table:

TABLE V.

Sample.	Found.	Actually.	Error.
Digitalin, 50%	Dil. 1 to 575	1 to 520	10% high
Tr. Digitalis 176% of Standard	110%	88%	20% high
Digitalin 50%, 1 to 500 sol.	Dil. 1 to 2.27	1 to 2.67	15% low
Tr. Digitalis 200% of Standard	Dil. 1 to 1.9	1 to 1.78	7% high
Digitalin 50%, 1 to 500	Dil. 1 to 2.16	1 to 2.67	19% low

Variations from 15% low to 20% high are too great to compare favorably with the accuracy of the M. L. D. frog method as frequently determined in this laboratory by tests of unknowns, some results being published in 1919 (6) in connection with a consideration of the cat and frog methods of assay.

SUMMARY.

The picric acid colorimetric method for digitalis assay proposed by Knudson was used on a series of nearly 100 samples of digitalis preparations including several dilutions that were unknown to the person making the tests. The original technique and standards as suggested were used and comparative results with those of the M. L. D. frog method were entirely too high. The potassium dichromate standard was dropped because of a distinct difference between the quality of its color and that developed in the samples. The ouabain standard was lowered from 0.266 mg. per 5 cc. to 0.20 mg. per 5 cc. and the average error was considerably reduced but the extremes were still too far apart. German digitalin and samples of digitoxin were also tried as standards and discarded because the color tests of different lots did not correspond with the activity by the frog method. Ouabain solutions were rather unsatisfactory because the rate of development of color was not proportional to that for digitalis. Readings at 20 minutes after mixture with the picric acid reagent seemed to be best but readings of standard and sample at 15 and 25 minutes after gave different results. A carefully stand-

ardized tincture of strophanthus representing a 1 to 20 extract of average drug was thoroughly tried as a standard, a 1 to 70 dilution being equivalent to the 1 to 25,000 dilution of U. S. P. ouabain. This was the most satisfactory of all the standards employed as it was a stable solution which did not need to be purified as digitalis preparations must be and the color seemed to develop a little more nearly in proportion with digitalis solutions. Comparative results even with this standard were very erratic and extremes were too variable to consider the method successful. Several samples of known dilution showed too large an experimental error when compared with the standards used above.

The chief objection to the color method for digitalis even if a suitable standard could be found and more consistent results obtained, would be, as Kruse has suggested, that, like the Hatcher cat method, it tests for total activity and fails to consider the absorption factor which is so important since most digitalis is given orally. Total activity and alimentary absorbable activity are often not proportional in different digitalis preparations. This is clearly shown by the fact that cat method assays of old tinctures of digitalis frequently show them to be highly potent while these same samples, if used clinically show little or no reaction indicating the deterioration which has occurred with aging. The frog method in which the rate of absorption of injected drug is a very important factor has been found to vary proportionally with actual therapeutic value.

CONCLUSIONS.

1. The picric acid colorimetric assay of digitalis preparations is not satisfactory for determining their total activity since it yields high and erratic results.

2. The various standards used such as digitalin, digitoxin, potassium dichromate, ouabain and tincture of strophanthus, as well as minor variations in the technique of the test, failed to make it possible to obtain consistent results with the colorimetric method.

3. The color test for digitalis is certainly not satisfactory for determining comparative therapeutic value since its results do not check with those obtained with the M. L. D. frog method on the same sample.

4. The M. L. D. frog method has been previously shown to be relatively accurate in the test of dilutions of preparations of known activity, has been shown to give results proportional to therapeutic value because the rate of absorption is an important factor in the frog method, and should therefore be the method of choice over the cat method and the colorimetric method for digitalis assay.

ABSTRACT OF DISCUSSION.

Chairman Berg commended the effort in making the comparisons and for simplification and reducing the costs of assays.

James C. Munch referred to the time and work represented by this report. He hoped that the work would be extended; he did not always feel satisfied with the results of the methods employed—there is apt to be variance in the hands of different operators, due to experience with the method employed.

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THE POSSIBLE INFLUENCE OF ETHER ANESTHESIA ON THE ACCURACY OF THE CAT METHOD OF DIGITALIS ASSAY.*

BY H. B. HAAG.

Assays of tincture of digitalis were carried out on decerebrated cats to determine whether ether anesthesia affected the accuracy of the cat method in the assay of digitalis.

Of the many objections raised to the cat method of digitalis assay one frequently brought forward is the possible influence of the anesthetic used. Berardi has recently called attention to the fact that etherized dogs manifest toxic symptoms following doses of digitalis which control animals tolerate with impunity. Here in our laboratory results have been obtained which have led us to believe that digitalis somewhat lowers the resistance of animals to poisoning by ethyl alcohol. Since ethyl alcohol and ether are related both chemically and pharmacologically the question arose in our minds as to the possible influence which ether might exert in the cat method of Hatcher. In an attempt to determine this digitalis was assayed on several series of decerebrate cats, and results here obtained compared with those in which etherized animals were employed.

The method used in preparing the decerebrate beasts was, with the exception of a few modifications, that described by Pollock and Davis of Chicago, the efficacy of which depends on the production of cerebral anemia following ligation of both carotids and the basilar artery. To avoid the use of ether, the animals were anesthetized with a mixture of nitrous oxide and oxygen, and were then tied to the operating table, the head being placed in a head holder. Both carotids were next exposed and ligated and a cannula inserted into the trachea. The gas mask was then removed, the anesthetic being continued by way of the cannula. The mouth was held opened by a suitable mouth-gag, and the tongue brought outside the oral cavity and held in this position by a cord. A median line incision was made in the soft palate from the posterior edge of the hard palate, thence caudad to the free border of the soft palate. The resulting flaps were retracted so as to better expose the underlying field. Next the mucous membrane and muscles of the base of the skull were dissected laterally in such a way as to bring into view the anterior border of the foramen magnum and the tympanic bullae. By means of a curette the bony field was cleared of adhering shreds of mucous membrane and muscle. A trephine opening was then made at a point midway between the tympanic bullae, about one centimeter anterior to the anterior border of the foramen magnum. For this procedure a foot-driven dental burr, of the Vulcanite variety, was used. This operation exposed the underlying *dura mater* which was then punctured and removed; this was to allow escape of the

* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

cerebro-spinal fluid and bring more fully into view the basilar artery. The artery was gently dissected and a Crile clamp applied, effort being made to place it so as to occlude the artery just caudad to the origin of the posterior superior cerebellar artery; following closure of this vessel the marked extensor position so characteristic of decerebrate rigidity ensued. Frequently at this point respiration became somewhat embarrassed, necessitating artificial respiration for a few minutes. The entire operation generally required about thirty minutes, occasioned no shock and very little hemorrhage.

Pollock and Davis state that in their laboratory cats decerebrated by their method frequently survived for twenty-four hours without any special attention. None of our control decerebrate animals lived as long as twenty-four hours, but we believe that the condition of the respiration and circulation remained fairly intact for three or four hours after the operation. And as the assays were made during this interval, the results might be considered indicative of the potency of the drug as determined on an animal of normal vital functions.

To allow recovery from the anesthesia and the operation, the assay was not begun until thirty or forty minutes after ligature of the basilar artery. The animals were then arranged in the usual way; the tincture, diluted one to ten with saline, being given by way of the femoral vein at the rate of one cubic centimeter every two minutes until death. The results of this are furnished by Table I.

TABLE I.—RESULTS OF DIGITALIS ASSAY ON DECEREBRATE CATS.

Cat No.	Sex.	Wt. in Kgm.	Total cc. dil. tr.	Mgm. leaf × Kgm. body wt.
1	Female	1.915	15.6	81.4
2	Male	2.670	17.0	64.0
3	Female	1.715	13.8	80.4
4	Female	2.650	20.0	75.4
5	Male	3.165	13.0	41.0
6	Male	4.060	25.0	61.3
7	Female	1.990	11.6	58.2
8	Female	2.595	17.0	65.5
9	Female	2.270	14.5	63.8
10	Female	2.965	17.0	57.3
12	Female	2.020	11.2	55.4
13	Female	1.700	15.5	91.1

Average mgm. leaf × Kgm. body weight = 66.2.

TABLE II.—RESULTS OF DIGITALIS ASSAY ON ETHERIZED CATS.

Cat No.	Sex.	Wt. in Kgm.	Total cc. dil. tr.	Mgm. leaf × Kgm. body wt.
1	Female	2.86	19.10	66.70
2	Male	2.77	23.10	83.30
3	Male	3.20	21.20	66.20
4	Female	2.75	20.40	74.10
5	Male	2.70	21.10	78.10
6	Female	2.10	14.80	70.50
7	Female	2.31	14.20	61.50
8	Male	3.35	26.80	80.00
9	Male	3.54	25.00	70.60
10	Female	2.215	22.10	99.80

Average mgm. leaf × Kgm. body weight = 75.0.

For purposes of comparison a second assay was made using etherized cats, precaution being taken that the anesthetic be very light throughout the entire procedure. Table II is a summary of these results.

DISCUSSION AND CONCLUSIONS.

Judging by our experiments we believe that the method of decerebration as elaborated by Pollock and Davis is free from many of the objections which embarrass methods heretofore described.

A comparison of the tables shows a difference of 8.2 mgm. leaf per kilogram cat in the two assays: this might be taken to indicate an unfavorable influence exerted by the procedure of decerebration. In our experience, however, it is rarely possible to have different series of etherized cats give results on the same preparation of digitalis which check more closely than this. So far as the number of experiments justify, it may be assumed that the light ether anesthesia necessitated in the Hatcher-Brody cat method of digitalis assay does not materially influence the resulting minimal lethal dose.

We owe our thanks to Parke, Davis and Co. for their generosity in furnishing the digitalis leaf used in these experiments.

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DEPARTMENT OF PHARMACOLOGY,
MEDICAL COLLEGE OF VIRGINIA,
RICHMOND, VA.

STUDIES OF THE VITAMIN POTENCY OF COD-LIVER OILS—XXI—THE STIMULATION OF REPRODUCTION BY FAT-SOLUBLE VITAMINS.*

BY ARTHUR D. HOLMES,[1] A. W. DOOLITTLE[2] AND W. B. MOORE.[2]

In a previous paper[3] it was reported that the addition of a vitamin-rich cod-liver oil to the ration of laying birds at the rate of one pint per 100 birds per week caused a material increase in the number of chicks hatched. These data regarding the influence of cod-liver oil on reproduction were obtained in a study conducted with three different breeds of domestic fowl maintained under a variety of conditions as regards ration and management.

The present investigation was undertaken to secure additional data concerning the effect of fat-soluble vitamins on reproduction, particularly with respect to the effect of various amounts of supplementary vitamin feeding.

EXPERIMENTAL PROCEDURE.

The experimental birds in this instance were eight months old Rhode Island Red pullets. The experimental period was of thirty-two weeks' duration, which

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* Scientific Section, A. PH. A., Philadelphia meeting, 1926.

[1] The E. L. Patch Co., Boston.

[2] Essex (Mass.) County Agricultural School.

[3] *Poultry Science*, Vol. V, No. 3 (February–March 1926).

was judged to be adequate for determining the reproductive performance of birds during their first laying season. The birds were kept indoors throughout the experimental period. The house, which was unshaded, was divided into five longitudinal pens, each of which had a north and south exposure. Accordingly, all the birds received like amounts of sunshine. Seventy-five birds were placed in experimental pens, 12′ x 24′, which provided approximately four square feet floor space per bird.

RATION.

The ration for both the experimental and control birds consisted of dry mash, hard grain and green feed. Oyster shells, grit, charcoal and water were before the birds constantly. The dry mash was fed in open hoppers of sufficient size so that all birds could eat at one time. The analysis of the dry mash showed it to have the following composition:

Moisture	9.0%	Crude protein	21.2%
Fat	5.3%	Ash	5.5%
Crude fiber	4.7%	N. F. E.	54.3%

The hard grain was fed twice daily in amounts which the hens would completely consume in about 20 minutes. The 8:00 A.M. feeding consisted of two parts wheat and one part oats; the afternoon feeding consisted of whole yellow corn.

It was necessary to change the type of succulent feed during the experiment. From November 25th to December 2nd all birds were fed cabbage; December 2nd to March 1st mangel beets, and for the remainder of the experiment sprouted oats. For ten days preceding the experimental period all birds received a tonic consisting of the following ingredients:

Gentian	1 lb.
Ginger	1/4 lb.
Salt petre	1/4 lb.
Sulphate of Iron	1/2 lb.

The tonic was given in the dry mash at the rate of two teaspoonsful per 100 birds per day. On the 20th of each month the birds were given magnesium sulphate in the drinking water at the rate of one pound per 100 birds.

NATURE OF COD-LIVER OIL.

A crude cod-liver oil produced by the steam process was used for this investigation. It was blended from oils made along the Massachusetts and Nova Scotia coasts; the proportion being 18% Massachusetts and 82% Nova Scotia oil. Its chemical and physical characteristics were determined in accordance with the methods of the United States Pharmacopœia[1] and were found to be:

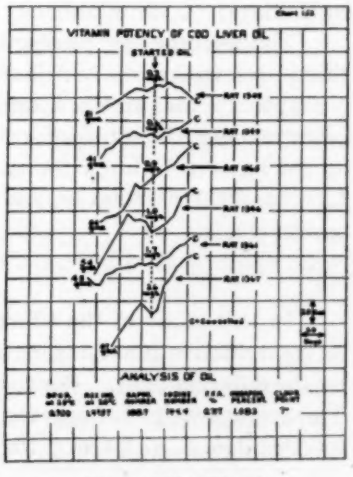

Chart 152—Fig. 1.

[1] U. S. Pharmacopœia X, J. P. Lippincott Co.

Sp. gr.	Ref. ind.	Sapon. value.	Iodine number.	F. F. A. per cent.	Unsapon.
0.920	1.4757	188.7	144.4	0.717	1.083

The vitamin A potency of the oil was determined by the usual laboratory procedure described in detail in earlier papers.[1] The results obtained are reported in Chart No. 152.

From these results it is evident that the oil in question had a vitamin content of approximately 1660 units per Gm.

The oil was fed to the experimental birds at the rate of 1/4 cc., 1/2 cc., 1 cc. and 2 cc. per day for Pens Nos. 2, 3, 4 and 5 respectively. Pen No. 1 was reserved as a control pen. The oil was incorporated in the hard grain ration on Mondays, Wednesdays and Fridays. The amount of oil allotted to the respective pens was poured over three quarts of cracked corn, the night preceding the feeding of the oil. The oil and corn were thoroughly stirred when first mixed and again the following morning before being fed to the birds. The corn-oil mixture was spread on top of the dry mash in the open-dry mash hoppers. The birds of Pens 3, 4 and 5 consumed all the corn and a considerable amount of mash within a half hour or so after feeding. For some unexplained reason, Pen No. 2 was much longer consuming the oil-soaked corn.

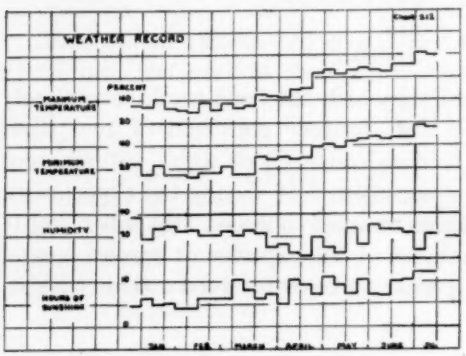

Chart 212—Fig. 2.

EGG PRODUCTION.

In order to readily compare the egg production of the different pens under observation, the egg yield is reported on a percentage basis; *i. e.*, the weekly egg production of a pen divided by 7 (days) × the number of birds in the pen.

The average egg production (Chart No. 213) for the experimental period of thirty-two weeks was 38.3% for Pen No. 1; 47.0% for Pen No. 2; 51.2% for Pen No. 3; 49.2% for Pen No. 4; and 56.6% for Pen No. 5. Expressing these results in another manner, the returns for the eggs produced by the five different pens considered on the basis of 75 birds for each pen throughout the experimental period were $308.34, $372.29, $399.49, $391.06 and $445.39 for Pens Nos. 1, 2, 3, 4 and 5 respectively.

WEIGHT OF EGGS.

In this study of the effect of a variation in the vitamin content of the ration on reproductive functions, data were collected concerning the size of eggs produced by the different pens. For this purpose, the eggs of each seventh day were weighed. The average weight of eggs for Pen No. 1 was 57.1 Gm.; for Pen No. 2, 58.6 Gm.; for Pen No. 3, 57.9 Gm.; for Pen No. 4, 58.8 Gm. and for Pen No. 5, 58.0 Gm.

[1] *J. Metabolic Research*, 2, No. 3 (Sept. 1922); *Ind. Eng. Chem.*, Vol. 16, No. 11, p. 1181 (Nov. 1924). *Ind. Eng. Chem.*, Vol. 17, No. 1, p. 75 (Jan. 1925).

While the difference in weight of eggs produced by the different pens is not large, the pens receiving cod-liver oil produced larger eggs than those of the control pen.

BLOOD CLOTS.

It has been often observed that stimulation of egg production is accompanied by an increase in the number of eggs containing blood clots. The occurrence of blood clots is supposed to indicate faulty functioning of reproductive organs. Accordingly, the effect of varying the vitamin content of the ration on the occurrence of blood clots was noted. The number of eggs containing blood clots was determined by candling the eggs each day. A further check on the number of blood clots was made when the eggs were consumed. The eggs produced by the pens under observation were used at the nearby Essex County Tuberculosis Sanatorium. The eggs were cooked in the patient's room and were opened at the bedside where

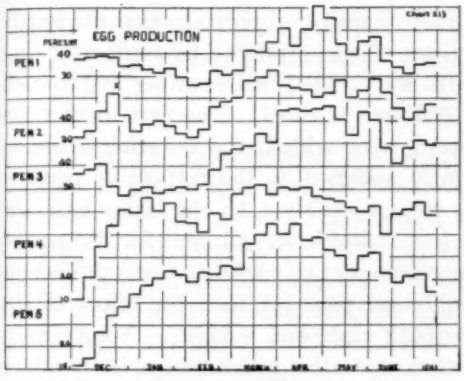

Chart 213—Fig. 3.

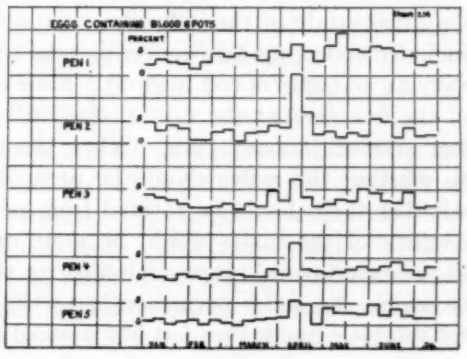

Chart 214—Fig. 4.

both patient and nurse had ample opportunity for observing the condition of the egg.

On referring to Chart No. 214, attention should be directed to the blood clots for the second week in April. The unusually large number reported was due to the overzealousness of a new assistant to make sure that no eggs containing blood clots reached the sanatorium. His error was not detected until too late to be corrected, and his record for blood clots for the second week of April is included, although it was known to be inaccurate.

The number of eggs containing blood clots was found to be 4.4%, 3.2%, 2.6%, 2.0% and 2.0% for Pens Nos. 1, 2, 3, 4 and 5 respectively. From these results, it is evident that under the condition of these experiments cod-liver oil materially decreased the occurrence of blood clots in hens' eggs.

WEATHER.

It has been assumed that weather conditions more or less affect egg yield, particularly during the winter season. On this account weather conditions were observed daily. Chart No. 212 reports the maximum and minimum temperature, the morning humidity and the number of hours of sunshine per day. For the sake of convenience, these data have been reduced to a weekly basis by averaging each

of these factors for the same seven-day periods as are reported for egg production and blood clots.

Comparing weather conditions with egg production and occurrence of blood clots, it appears that other factors such as ration, reproductive capacity of the birds, etc., overshadow any effect that weather may have on the reproductive performance of the domestic fowl. It is of interest to note that during March and April, the egg production of all pens increased while the average number of hours of sunshine daily remained more or less constant. In this instance, increased production was not primarily due to additional stimulation by sunshine, but rather to the birds inherent tendency for reproduction. The amount of data at hand are too limited to permit of generalization concerning the relationship between weather conditions and reproductive activity.

FERTILITY.

This study of the influence of fat-soluble vitamins on reproduction obviously included collecting data concerning the fertility of eggs produced by birds receiving varying amounts of cod-liver oil. Male birds were added on December 2nd to each of the five pens at the rate of one male to fifteen females. The first incubation was started January 12th. When the males were added, the question arose as to whether the males should be permanently assigned to the respective pens or whether they should be rotated from pen to pen weekly. In the latter case the fertility of the males would be more or less uniform for all pens for the period of the experiment. It was felt that for the purpose of this study, it was preferable to assign the males permanently to the different pens for then the effect of the fat-soluble vitamins on fertility applied to both male and female. Accordingly, record was made of the number of eggs discarded after seven and after fourteen days incubation either on account of the eggs being infertile or containing a weak germ. The data collected for the incubation of 4906 eggs are summarized in the following table:

FERTILITY RECORD.

Pen number.	Number of eggs incubated.	Eggs discarded after 7 days.	Eggs discarded after 14 days.	Average fertility.
1	1008	7.3%	3.6%	94.6%
2	923	9.8%	2.1%	94.1%
3	887	7.7%	2.2%	95.1%
4	1025	7.2%	2.3%	95.3%
5	1063	6.1%	1.6%	96.2%

While the number of eggs discarded on the first and second tests does not vary consistently with the amount of oil fed to the birds in the various pens, it is quite evident that oil-fed birds produced more fertile eggs than those of the control pen.

HATCHABILITY.

Inasmuch as some chicks which develop to apparent maturity are unable to get out of the shell, data concerning the hatchability of eggs are of more material importance to one interested in reproduction than data regarding fertility. Accordingly, the detailed data concerning the chicks obtained from the 4906 eggs which were incubated under like conditions are summarized:

HATCHABILITY RECORD.

Date set.	Pen No. 1. No. eggs.	Pen No. 1. Per cent.	Pen No. 2. No. eggs.	Pen No. 2. Per cent.	Pen No. 3. No. eggs.	Pen No. 3. Per cent.	Pen No. 4. No. eggs.	Pen No. 4. Per cent.	Pen No. 5. No. eggs.	Pen No. 5. Per cent.
Jan. 12	120	56.5	93	64.5	82	69.5	133	76.0	120	80.6
Feb. 3	120	59.2	120	59.8	118	60.2	120	70.0	120	65.0
Feb. 28	217	47.5	160	51.2	152	55.3	251	48.6	246	53.7
Feb. 28	120	50.0	120	65.8	120	58.3	120	64.2	120	74.2
Mar. 9	283	63.6	276	70.0	265	60.3	251	76.5	300	78.0
Apr. 24	148	47.8	154	70.7	150	76.6	150	77.9	157	81.4
Total eggs set	1008		923		887		1025		1063	
Average hatchability		53.9		63.6		63.3		68.8		72.1

These tests show the hatchability of the eggs produced by the different pens to be 53.9% for Pen No. 1; 63.6% for Pen No. 2; 63.3% for Pen No. 3; 68.8% for Pen No. 4 and 72.1% for Pen No. 5. These data show quite conclusively the effect of supplementary fat-soluble vitamin feeding on hatchability.

VIABILITY OF CHICKS.

A study of reproduction involves first obtaining information concerning the number of young that may be produced and second, concerning the capacity of young to live and grow. Accordingly, information was collected concerning the viability of chicks produced from the different pens. In order to make the data more or less general in character, the day-old chicks from each pen of birds were distributed equally in five different brooder houses. Also each house contained, as controls, 200 day-old chicks (Rhode Island Reds, Barred Rocks and White Leghorns) produced under normal flock conditions by birds receiving one pint of cod-liver oil per 100 birds per week.

The houses were so distributed in an open field as to be somewhat differently effected by atmospheric conditions. The first night the chicks were in the brooder houses the temperature suddenly fell to 4° F., and coincidentally the caretaker contracted influenza and was removed to the hospital. As a consequence, the chicks were subjected to extremely unfavorable environmental conditions. From the standpoint of practical poultry management, this situation was little short of a catastrophe, but from the standpoint of securing information relative to the chicks' capacity to withstand adversity, the situation was extremely favorable.

VIABILITY OF CHICKS.

Mortality during First Five Weeks.

Experimental pen.	Per cent mortality.	Control.	Per cent mortality.
1	58%	Reds	11%
2	23%	Rocks	11%
3	8%	Leghorns	9%
4	15%		
5	9%		

At the end of five weeks, the number of chicks remaining was 42% for Pen No. 1; 77% for Pen No. 2; 92% for Pen No. 3; 85% for Pen No. 4; 91% for Pen No. 5 and 89%–91% for the controls. These data offer quite definite evidence

that the viability of chicks produced by birds receiving a diet rich in the fat-soluble vitamins is greater than that of chicks produced by birds maintained on a diet containing no supplementary source of fat-soluble vitamins.

BROODY BIRDS.

As data accumulated showing that supplementary fat-soluble vitamin feeding increased the reproductive activity of the birds, it was questioned whether it would also increase the tendency of birds to become broody. Records kept concerning the total number of broody birds showed 105 birds for Pen No. 1; 84 for Pen No. 2; 77 for Pen No. 3; 105 for Pen No. 4 and 78 for Pen No. 5. In each instance the number of broody birds exceeds the total number of birds in the pens. This is due to some birds being broody twice and occasionally even three or four times. A portion did not exhibit signs of broodiness at any time. Considering the data as a whole, it does not appear that the supplementary use of fat-soluble vitamin influence broodiness.

BODY WEIGHT.

All birds included in this investigation were weighed five times during the experimental period. The average body weight of the different pens is reported below:

AVERAGE WEIGHT OF PULLETS.

Pen no.	Average wt. 11/11/25	Average wt. 1/29/26	Average wt. 4/6/26	Average wt. 5/14/26	Average wt. 7/6/26
1	5.6 lbs.	6.2 lbs.	6.3 lbs.	6.2 lbs.	6.2 lbs.
2	5.9 lbs.	6.5 lbs.	6.5 lbs.	6.5 lbs.	6.3 lbs.
3	6.1 lbs.	6.5 lbs.	6.4 lbs.	6.4 lbs.	6.2 lbs.
4	4.9 lbs.	6.6 lbs.	6.6 lbs.	6.6 lbs.	6.4 lbs.
5	4.6 lbs.	6.6 lbs.	6.6 lbs.	6.4 lbs.	6.5 lbs.

Of particular interest is the average body weight of the birds of different pens at the termination of the experiment. It is a matter of repeated observation by poultrymen that birds which are relatively high egg producers ordinarily suffer a reduction in body weight as the period of high egg production progresses. In this instance, however, it will be noted that the birds of Pen No. 5 averaged a higher body weight at the termination of the experiment than that of the birds of any of the other pens, even though their egg production exceeded that of the other birds.

MORTALITY.

Inasmuch as stimulated reproduction is often accompanied by a lowered body resistance to disease, it was of interest to collect data concerning the mortality for the different pens of birds under observation. The following table supplies

MORTALITY OF PULLETS.

Pen 1.	Pen 2.	Pen 3.	Pen 4.	Pen 5.
9 birds	12 birds	5 birds	3 birds	2 birds
12%	16%	6%	4%	2%

Cause of Death.—Cancer, 1; Over Fat, 1; Roup, 1; Tuberculosis, 1; Bronchitis, 1; Heart Rupture, 2; Undetermined, 3; Prolapsis, 21.

information concerning the total number of deaths and concerning the cause of the deaths.

Inasmuch as nine of the control birds and twelve birds in the pen receiving only 1/4 cc. of cod-liver oil a day died as compared with 5, 3 and 2 birds respectively for Pens Nos. 3, 4 and 5, it is evident that the addition of fat-soluble vitamins as a supplement to the ration materially increased body resistance to disease. On referring to the various causes of deaths, it is of interest to note that by far the greatest number of deaths was occasioned by prolapsis of the oviduct. Of striking importance was the apparent immunity of these birds from the common poultry diseases that were usually prevalent in the immediate locality during the period of this experiment. The mortality rate for common poultry diseases was 2.2%, and the deaths from such diseases was practically confined to Pen No. 1 and Pen No. 2.

FLAVOR OF EGGS AND FLESH OF BIRDS.

As stated above, the eggs produced by the cod-liver oil-fed birds, except those reserved for incubation, were eaten by patients of the Essex County Tuberculosis Sanatorium. Inasmuch as at no time during the thirty-two weeks' experiment was any comment made by any of the patients concerning the eggs possessing any unusual flavor it was concluded that the cod-liver oil used in this test did not impart any flavor to the eggs.

To test whether long continued feeding of cod-liver oil imparts flavor to the flesh, a number of birds from Pen No. 5, which had received 2 cc. of oil daily for thirty-two weeks, were killed. Some of the birds were roasted under normal household conditions and eaten in private homes by persons uninformed concerning the bird's ration. Some were stewed and eaten by poultrymen and their families. Also a number of birds were sampled by instructors and investigators in poultry husbandry. None of the sixty persons who partook of the birds made any comments indicating the presence of any unusual flavor. From this it is evident that the cod-liver oil under consideration did not impart any detectable flavor to the flesh of the birds.

VITAMIN CONTENT OF EGGS.

The vitamin A content of eggs produced by the experimental birds was determined early in the experiment and at its termination. Albino rats were used as test animals and the usual laboratory procedure was followed. Each day during the thirty-five day vitamin test, an egg was collected from each of the five pens. Five groups of rats were fed 0.03, 0.06, 0.12, 0.50 and 1.00 cc. of egg yolk daily. In the first test, which was started two months after the birds began to receive cod-liver oil, the eggs produced by the cod-liver oil fed birds were found to possess a higher vitamin content than among those produced by the control birds. In the test conducted after the birds had received oil for six months, it was found that the difference in the vitamin A potency of eggs from the control and experimental birds was materially greater than in the earlier test. The vitamin A potency of eggs from the control birds had decreased as the experimental period advanced. On the other hand, the vitamin content of eggs from the experimental birds increased during the experimental period. From this it appears that supplementary feeding of cod-liver oil increases the vitamin content of hens' eggs.

SUMMARY.

In order to make it possible to easily summarize the results of the studies here discussed, the data essential for this purpose has been brought together in the table which follows:

SUMMARY OF RESULTS.

	Pen 1.	Pen 2.	Pen 3.	Pen 4.	Pen 5.
Egg Record.					
Production	38.3%	47.0%	51.2%	49.2%	56.6%
Blood spots	4.4%	3.2%	2.6%	2.0%	2.0%
Weight of eggs	57.1 Gm.	58.6 Gm.	57.9 Gm.	58.8 Gm.	58.0 Gm.
Fertility	94.6%	94.1%	95.1%	95.3%	96.2%
Hatchability	53.9%	63.6%	63.3%	68.8%	72.1%
Viability of chicks	42.0%	77.0%	92.0%	85.0%	91.0%
Pullet Record.					
No. of broody birds	105	84	77	105	78
Body wt. at end of expt.	6.2 lb.	6.3 lb.	6.2 lb.	6.4 lb.	6.5 lb.
Mortality	9	12	5	3	2

To determine the influence of fat-soluble vitamins on the reproductive performance of domestic fowl, five pens of birds, one control and four receiving $^1/_4$, $^1/_2$, 1 and 2 cc. of cod-liver oil daily were under observation for a period of thirty-two weeks.

The egg production for the different pens shows that the addition of fat-soluble vitamins to the poultry ration employed very definitely stimulated egg production.

The average weight of eggs produced by the oil-fed birds was slightly greater than that of the eggs produced by the control birds.

The appearance of blood clots in hens' eggs indicates the inability of the reproductive organs to function normally. In these tests the percentage of eggs containing blood clots decreased consistently with the increase of cod-liver oil in the experimental ration.

From the limited data available, it does not appear that the weather conditions materially influenced the reproductive activities of birds under observation.

The number of eggs discarded during incubation either from being infertile or on account of containing a weak germ was less for the oil-fed than the control birds; Pen No. 5 showing the highest fertility.

The number of chicks obtained from the eggs produced by the oil-fed hens was greater than that obtained from the eggs from the control birds; approximately 18 chicks per 100 eggs more for Pen No. 5 than for Pen No. 1.

The viability of chicks from the oil-fed hens exceeded that of the control birds; this was particularly noticeable for the birds receiving the larger amounts of oil.

The number of birds in the different pens becoming broody during the course of the experiment does not show that supplementary use of cod-liver oil influences this factor.

Contrary to commonly observed conditions, the body weight of the high producing birds did not decrease, but their weight at the end of the thirty-two weeks' experiment exceeded that of the control birds.

The mortality of the high producing birds was lower than that of the control birds. The data obtained for body weight and mortality showed that the physical conditions of the high producing birds was equal to and probably better than that of the birds which received no supplementary vitamin feeding.

The cod-liver oil used in this test did not impart any detectable flavor to either the eggs or the flesh of the birds.

The vitamin A content of the eggs was determined twice during the experiment. In both cases the potency of eggs from the experimental birds exceeded that of the controls. The potency of eggs from the control birds decreased, and the potency of eggs from the experimental birds increased as the experiment progressed.

Considering the results as a whole, the evidence is quite conclusive that supplementary fat-soluble vitamin feeding increases the reproductive performance of the domestic fowl.

ABSTRACT OF DISCUSSION.

Arno Viehoever inquired whether the growth of the chicks was stimulated by regular feedings of cod-liver oil.

The author replied that it depends on conditions—an adequate diet need not be bolstered.

L. F. Kebler inquired whether cod-liver oil would increase egg production.

The author replied that he would not have any one draw the conclusion that cod-liver oil always increases egg production, but if hens are receiving a low vitamin diet, their egg production can often be materially increased by using cod-liver oil.

H. C. Wood inquired relative to the diet of the control chickens.

The author explained the feeding and stated that the rations were those usually given by the commercial poultrymen.

L. F. Kebler inquired of the author whether he had made observations on increased egg production by the addition to feed of vitamins, directly or indirectly.

The author referred to the results reported in this paper and to work being done in Ohio, Rhode Island, etc.

F. W. Nitardy referred to work being done in Connecticut. His recollection was that cod-liver oil produced better results than other feedings.

The question was asked whether the author had experimented with rice in the feed.

A. R. L. Dohme asked whether there were statistics available along related lines in reproduction of other animals than pullets.

The author replied in the affirmative and referred to studies of the effect of adding calcium and mineral to the ration and to the investigations in Texas, Idaho and Massachusetts.

A. R. L. Dohme commended the work of the author; he thought Mr. Holmes was overcautious in his statements; if pharmacists can, in confidence, recommend cod-liver oil for speeding the growth of poultry and improving its condition they will be rendering a service.

CONVENTION EXPENSES HELD DEDUCTIBLE FROM INCOME.

Expenses incurred in attending meetings of the American Chemical Society and other scientific gatherings are ordinary and necessary business expenses in the case of Alexander Silverman, professor of Chemistry at the University of Pittsburgh, according to a ruling by the Board of Tax Appeals.

Prof. Silverman deducted $558.75 from his gross income in 1921 as expenses in attending meetings of the American Chemical Society and the American Ceramic Society for the purpose, as he contended, of keeping thoroughly informed in his field of work and in touch with other scientists, and in order to advance the interests of the University.

The Board held that expenditures of this character and made under such circumstances are deductible as an ordinary and necessary business expense.

THE THEORY AND ART OF PHARMACOPŒIA REVISION, IN THE INTEREST OF PHARMACAL SERVICE.*

BY H. H. RUSBY, M.D.

THE THEORY.

The theory of this important subject is based on the following fundamental principles:

1. The general object and function of the Pharmacopœia are the same as they were originally, in spite of changes in method and detail, resulting from changed conditions.

2. The object is the safety and welfare of the sick and of the interests of physicians and pharmacists, in order that that object may be better attained.

3. The Pharmacopœia is not a therapeutical work and its only legitimate attention to therapeutics is to see that the articles in use are genuine, pure and of standard quality.

4. Each successive edition should be an improvement upon its predecessor, in the factors of scope, nomenclature, methods and scientific and linguistic accuracy.

5. Scientific and linguistic accuracy should not be limited to important practical matters. The revision of the Pharmacopœia is supposed to be performed by the highest representatives of medicine and pharmacy, and the credit of these professions forbids that accuracy of detail should be ignored when it does not involve some practical objective. The definitions of the Pharmacopœia should be complete in themselves, including by their language the whole of the article defined and excluding all else.

6. Changes from a preceding edition that are not based on the above considerations are objectionable, and should not be made lightly, or without full consideration.

7. Pharmacopœia revisers should be thoroughly familiar with the researches and their results of preceding Committees, to avoid useless repetitions and the possible reversal of former correct conclusions.

8. The Pharmacopœia is essentially a book of standards for medicinal agents in common use, these standards being maintained by it through the use of the physical, chemical and biological tests that it provides for this purpose, and of prescribed processes of manufacture and preparation.

9. In providing these requirements, full attention must be given to the legal responsibilities involved, especially to the fully established principle that the courts cannot sanction a departure from the Pharmacopœial requirements on the ground that the requirements are erroneous. The courts have often ruled that the language of the Pharmacopœia must be followed, even though that language is such that it defeats the object for which it was framed.

10. The Pharmacopœia is complete in itself, not being associated with any other similar work, unless such work is the product of its own procedures, carried out with full authority over both works, and producing both with full consideration that they are parts of one whole. In other words, there is no authority

* Read before the New York Branch, A. PH. A., March 4, 1927.

whatever for the repudiation by the Pharmacopœia of any part of its responsibility, notwithstanding that the statute may impose a similar responsibility on some other agency.

THE ART.

The art of Pharmacopœia revision is based on an exhaustive study of the above principles, in all their bearings, and in the device of such methods as will most efficiently employ these principles in the work of revision. It forbids the employment in Pharmacopœial revision of anyone who is not fundamentally and effectively conversant with this subject. Yet we have seen men engaged in Pharmacopœia revision who were disqualified in nearly all of these directions, and it is doubtful if a majority of the workers on any revision have been fully conversant with the results of the investigations conducted by previous committees. The last mentioned defect is probably responsible for more Pharmacopœial errors than all others combined.

Let us consider the United States Pharmacopœia, as it stands to-day, and see what evidence it presents of having been revised in accordance with the principles that have been enunciated. Since it is my intention to confine myself, on this occasion, to the defects in the work, I will say at once that this revision is a great improvement on its predecessor and is, on the whole, an admirable work. I believe, however, that the revision is fundamentally wrong in certain directions, and that it contains many serious defects that should be corrected.

Under principle number one, we note that all historical data available prove the original object of the Pharmacopœia to have been that stated in principle No. 8, but we have seen the gradual substitution of two totally different and wholly unjustifiable objects, (*a*) the recommending to the medical profession of those medicines which a certain number of the medical men on the Committee of Revision think should be used, and (*b*) the creation of a false belief, especially in foreign countries that those not admitted are not used here. The latter objective may be condemned on simple ethical grounds. The former is a gross violation of the third principle, as it is the conversion of the Pharmacopœia into a work of therapeutic claim and controversy. Not only have we had conclusive evidence that some of these claims, as to both value and the absence of it, have been erroneous, with a probability of many other such cases, but we know that the airing of such opinions is no part of the office of the Pharmacopœia. The only ground that can properly justify the inclusion of an article in the Pharmacopœia is the protection of the patient who uses it, as to its standard character, and the only one that can justify its exclusion is the fact of its insufficient use. No State or federal statute has the slightest ground or excuse for saying that its provisions for the saftey of citizens shall be limited to that of the patients of certain physicians or of a certain class of physicians. Undoubtedly, the therapeutics of the eclectic physician are, on the whole, inferior to those of the regular school, although, under the present growing neglect of the study of materia medica by the latter, this condition is likely to become reversed. The important fact is, however, that the patients of eclectics have the same claim to statutory protection as any others. We might as properly restrict the laws against robbery and assault to the patients of a certain class of physicians as the protection of the Food and Drugs Act.

But it is not only the patient who is placed in peril by such limitations in the treatment of medicinal agents. The statute holds the pharmacist strictly responsible in his relations with the patient. This responsibility exists quite as clearly, though not so explicitly expressed, in the case of a non-official as an official article. The very object of official treatment is to give the pharmacist the means of meeting this responsibility. To refuse this assistance is to place him, as well as the patient, in jeopardy. Hence the latter part of my title, which refers to pharmacal service, this including the interests of both.

Our fourth principle provides for proper delections as articles go out of use or for inclusion as new ones come in under the influence of modern knowledge. This principle cannot be considered aside from Nos. 5 and 6.

The subject of nomenclature has been very greatly neglected. The fact that the general principle of botanical nomenclature—or rather the absence of any principle—is fundamentally wrong and in conflict with that applied to zoölogical names, may be overlooked, as it is in accord with an international agreement to employ certain designated incorrect names. I should rather see our own Pharmacopœia independent enough to be accurate in this, as in other things, but there are two sides to this question, and I am willing to conform to custom, on the expressed understanding that we know we are wrong and yield to convenience. What I should like, however, is a frank admission of the fact in the preface of the book, so that more careful authors, who refuse to employ inaccurate names, even by agreement, should not be placed in a false position by Pharmacopœial authority.

Quite aside from this mooted question, there are glaring cases of violation of accepted rules of nomenclature. Consider the adoption of the purely Spanish title "Cascara Sagrada" as the Latin title and the relegation of "Rhamnus Purshiana," which is purely Latin, to serve as the official English title! The purely Latin title Balsamum Tolutanum is assigned to the English position, while "Tolu," an utterly barbarous name, occupies the Latin position. We might refer here to far worse things done by the National Formulary. "Guaiacum," formerly the title of Guaiac Wood, while the resin had to be called "Guaiac Resin," or "Guaiaci Resina," has now become the designation of the latter. In a similar way, the titles of Iris versicolor and Orris have been transposed, notwithstanding that one is innocent and the other decidedly poisonous.

This brings us to remark that, for many successive revisions, one of the first procedures of the leaders was to secure the adoption of a rule, that, while changes in the definitions should be made in the interest of scientific accuracy, the safety and convenience of the public required that changes in titles should not be made except for urgent reasons. The abandonment of this principle is one of the indications of the decline of the safe conservatism that formerly ruled.

Coming to the subject of scientific and linguistic accuracy, we find the present edition of the Pharmacopœia contains many such inaccuracies.

The definition of Glycyrrhiza well illustrates this class of errors. The name "Glycyrrhiza glabra" means one that is destitute of trichomes, while "Glandulifera" means one that is covered with glandular trichomes. Thus, when we say "Glycyrrhiza glabra, variety glandulifera," we mean a plant without any trichomes that is covered with trichomes! It is quite possible that one knowing these plants only externally might regard one as a variety of the other, but not if he

has examined them histologically. However, even in that view, the definition might be shortened gracefully by saying "varieties of Glycyrrhiza glabra, having a yellow and sweet wood." The expression now used is "yielding" a yellow and sweet wood, the word "yielding" not being well chosen.

The present definition and description of Myristica violates almost all of the principles here enunciated. During the reign of a former revision, a lot of nutmegs were seized, at the Port of New York, by the Bureau of Chemistry, because a tuft of mold was found in the cavity at the end. It was established that no nutmegs are ever imported that are free from this condition, but this knowledge could not change the fact that the shipment was in violation of the legal standard. The Bureau, of course, has the option of refraining from making further seizures, but to just that extent it must ignore the Pharmacopœia and place the latter in an apologetic position. Those familiar with these facts secured a mention, in the succeeding revision, of this peculiarity of nutmegs, thus giving them a legal standing, but at the most recent revision this was deleted, showing that the member responsible for the present definition was not well-informed on the history of the subject.

The situation is even worse with the definition of tar, as "a product obtained by the destructive distillation" etc. If a definition does not define, it performs no office. This definition does not tell us which of the scores of "products" of this process is the one intended. The only defense that can be rendered is that the description gives this information. If this reply were to be formulated, it would say "There is no use of having a definition if the description is sufficient." If this is true, then the definition should be omitted altogether, for it is far less discreditable to the revisers to have no definition at all, than to print one that is without meaning or effect. How have the mighty fallen when such careless methods are substituted for the fine scholarly work of such a man as Charles Rice!

Our third proposition, that the Pharmacopœia is not a therapeutical work, has never been denied or questioned in terms, although many times it has been reiterated in pharmacopœial publications. Nevertheless, to reject an article in common medicinal use by physicians, because a majority of the physicians in the revision committee regard it as not therapeutically useful is quite as definitely making the book a therapeutical authority as it would be in describing the uses of the article. But our revisers have gone farther—very much farther—than this, for they reject articles unless their therapeutical usefulness has been "proved." That is to say, an article prescribed by the vast majority of American physicians, but the therapeutical usefulness of which is not accepted as "proved," may be deleted from the Pharmacopœia, as was done with Chenopodium and its oil. Furthermore, no statement is made, nor is there even any implication, as to when or by what method such therapeutic usefulness must be proved, nor who is to be the judge of the sufficiency of such proof. If any reader can suggest a possible case of greater indefiniteness or general looseness of language than this, let us have it. Let it be noted, also, that this language does not refer to an insignificant matter of verbal expression, but to a practice that is to leave millions of patients on whom such articles are used, whether recognized by the U. S. P. or not, to be deprived of the safety and benefit for which the Pharmacopœia exists, and to leave thousands of pharmacists exposed to the danger of prosecution. All

that is necessary in order to secure the deletion of an article from the Pharmacopœia under this provision is for some member of the Revision Committee to deny its usefulness and then to refuse all proof to the contrary. And what is the object of all this? Merely to justify a few men who believe—rightly in most cases, it must be admitted—that their judgment in such matters is superior to general practice. The Pharmacopœia is not the place in which to carry out their missionary work. Physicians' textbooks and other publications constitute the medium for imparting therapeutical instruction. If physicians are too indolent or incompetent to reform the practices of their professional brethren, the sick people of the United States are not the ones to be penalized, even potentially, for this failure.

The habitual and gross violation of principle No. 6, is doubtless chiefly due to a disregard of No. 7. To the experienced student of Pharmacopœial changes, it is perfectly obvious that persons with no knowledge of the reasons that have led their predecessors to adopt certain statements and expressions, have casually made changes of language here and there for the mere purpose of "doing something," and without either knowledge or judgment concerning the consequences of their own work. Again and again we have seen the painstaking care of eminent scholars who have labored with past revisions, carelessly destroyed by those who had not reviewed the studies and investigations on which the results had been based.

Little need be added to the enumeration of our ninth principle, unless it were to recite the numerous decisions of courts which support it. It is a pity that some of us who are frequent witnesses in court cannot find time to compile a digest that would indicate clearly what must be expected when the plea is made that a U. S. P. provision is erroneous and should be disregarded. More than once, I have heard a judge repudiate the suggestion that he had authority to alter or minimize the statutes. I have even heard one say to an attorney, "You might prove to me that the requirement of the Pharmacopœia is so worded as to defeat its own purpose; to result in actual danger, while your departure from it is beneficial, and still I have to decide that you have violated the law." I have personal knowledge that some of our U. S. P. revisers have no adequate conception of the importance of this consideration. They appear to take the ground that an error in the text is of no practical moment, because it can be overlooked in practice. Even if this were true, and it must be admitted that often the law is ignored, still it would be shameful for our Pharmacopœia to be placed in a position where the most charitable thing that can be said of it is that it is irresponsible. It is still worse when this position is deliberately taken in advance by the revisers, yet it is undeniable that this has been done when just corrections have been offered and have been rejected.

The most important part of this paper is its discussion of principle No. 10, since this is the point concerning which the largest number of people responsible for Pharmacopœial policy and procedure are the most widely astray. I fail to understand why it is so difficult to secure acceptance of the fact that there is no logical or practical ground whatsoever for a division of work of the same kind between the U. S. P. and the N. F. Aside from all practical considerations, it is a blot upon the intelligence of both American medicine and American pharmacy

that such an idea should exist among representative members of these professions. The establishment of the National Formulary, to do the work that it was intended to do, was an important accomplishment, but its present procedure is very injudicious when sincere, and very vicious when not.

Let us consider some of the things that might happen to occur. The first of them is not a mere possibility, because we have several concrete examples of it. Physostigma was dropped from the U. S. P., doubtless with the expectation that it would be taken up by the N. F., but this was not done. We now have the extract of this drug, a favorite medicament of many excellent physicians, in the N. F., with no official recognition, description or standard for the drug from which it is made! And why should this not be the case? What right has the U. S. P. to assume what the N. F. people are going to do? There is no official connection between them, and there should be none, unless a single body should revise both works. There are other and similar instances to that of Physostigma, and there might be many more. As a matter of fact, the Revision Committee of the U. S. P. has no guarantee whatever of the continued publication of the N. F., or that, continuing to be published, it will continue to include the drugs deleted from the U. S. P. The fact is that the whole of that kind of work that is performed by the U. S. P. should be done by it and that only work of a different kind should be performed by the N. F. If the N. F. Committee desired and cared to do its full duty to the people of the United States, it would refuse to take up any crude drug or similar article when deleted by the U. S. P. and it would join in a concerted effort to compel that book to perform its legal duty. In case the U. S. P. Committee repudiated this public obligation, suppose that the pharmacists of the nation were to respond by repudiating the U. S. P., by declaring that the N. F. should be made complete in itself, and should publish a complete Pharmacopœia that would include all commonly used drugs, whether they are already in the U. S. P. or not! There is no organic reason why this should not be done. It is true that people are too sensible to adopt such a course, but the U. S. P. is not on this account any less responsible for it as a potential act than as an actual one. Then, indeed, we should have a double standard, but the situation, as to principle involved, would not differ at all from what it is at present.

There is but one rational and, on the whole, but one practical method of correcting the evil position in which American pharmacists have placed themselves by their too ready submission to the dictates of a small group of medical men, and that is to make a complete separation in the character of the work of the U. S. P. from that of the N. F., and then to see to it that each performs its full duty to the public. It is true that we can resort to makeshifts, and become a body of time-servers, adopting one wrong procedure after another to counteract the evil effects of the preceding one.

Let it never be forgotten that a hundred pharmacists make actual use of the U. S. P., for important purposes, for every once that a physician so much as looks at it; that probably a majority of the physicians of the United States do not know the difference between the Pharmacopœia and the Dispensatories, and that 95 per cent of them never saw a copy of the Pharmacopœia. Whose interests are at stake under such conditions? Not those of either of these two professions, but of the patients served by them. These patients are affected a thousand times

more frequently through the use made of the Pharmacopœia by pharmacists than through such use by physicians. How can any intelligent and sincere person be in doubt as to whose services should be facilitated by this great national legal authority?

It is my desire to study carefully through the text of the Pharmacopœia for the detection of violations of all these principles, but of what avail will this be unless the Committee is fully committed to the policy of observing them?

Convinced as I am that it is the duty of all pharmacists and of all well-intentioned physicians to restore the U. S. P. to the full measure of its former usefulness, I offer the following resolutions for adoption by the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, and I call upon our brother pharmacists in all sections of the country to secure similar action by their schools and associations of pharmacy.

1. *Resolved*, that the term "pharmaceutical necessity," as used in the U. S. P. shall be construed as meaning that the book shall include all articles that the professional pharmacist is commonly expected to supply; that in place of the term "proved therapeutic usefulness" there be substituted that of "common therapeutic use," that the U. S. P. should contain standards for all crude drugs and similar legitimate medicinal articles believed by the Committee on Revision to be sold in twenty-five per cent or more of the pharmacies or drug stores of the United States, in their crude condition, or in the form of preparations, or of both.

2. *Resolved*, that we use our best efforts to secure the appointment of delegates to the next Pharmacopœia convention who shall go instructed to secure the adoption of this resolution or one of similar purport, as a basic rule of procedure for the next Committee of Revision.[1]

PHARMACISTS OF FIFTY YEARS AGO HAD THEIR PROBLEMS TO SOLVE THE SAME AS PHARMACISTS OF TO-DAY.

The *Chemist and Druggist*, of February 5th, reprints an article under "Superfluous Pharmacy," which appeared in this publication Feb. 15, 1877. It reads: "Days of perplexity and trial are at hand for the retail pharmacist. The stores have snipped off a percentage from his sundries and patent medicines; a benevolent association strives to close his doors at an early evening hour; and now a fair city is about to rise where there shall be the least possible ill-health. 'I have projected a city,' said Dr. Richardson, 'which shall show the lowest mortality. Our city, which may be named Hygeia, has the advantage of being a new foundation, but it is so built that existing cities might be largely modelled upon it.' The promised land has emerged from the shadows of a Social Science lecture, and here it is spread out before us on the table mapped and planned, with broad streets and gardens, a mile of sea front, good drainage and comfortable dwellings. The estate is called Courtlands, and is situated close by Worthing. Should the plan succeed, the druggist must seek out some other occupation and take himself and his galenicals to a less favored spot. Serious misgiving must be felt at this novel application of the motto, 'Habenda ratio valetudinis.' "

PRODUCTION OF ATTAR OF ROSE IN BULGARIA.

According to estimates, the production of attar of rose attained about 1600 kilos in 1926, an output slightly smaller than that attained in 1925. Of the total about 1000 kilos were produced in factories, and the other 600 kilos in peasant homesteads. It is claimed that almost all of this production has been sold or contracted for sale.

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[1] These resolutions were unanimously adopted.

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All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. E. Cor. Lombard and Greene Sts., Baltimore, Md.

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(*To be continued*)

THE DISCOVERY OF ETHER ANÆSTHESIA.

"Palman qui meruit ferat."

BY JOSEPH JACOBS.

To any fair-minded investigator it will seem strange that there should be writers who would award priority of discovery of the use of ether in surgery to anyone but Dr. Crawford W. Long, of Georgia. Yet in January *Scientific Monthly*, Dr. C. A. H. Smith devotes more than six pages to statements and arguments attempting to show that the honor should be bestowed upon Dr. W. T. G. Morton, of Boston, Mass.

That article—outside of its introduction dealing with the history of anæsthesia in general, its detailed biography of Morton, its disclosures of Morton's labored efforts to use the discovery of another for his personal gains, and its expression of regret that all the enumerated unethical acts of Morton should have brought him the contempt of his associates (but ignoring the condemnation of the American Medical Association and former resolutions of repudiation)—beclouds the truth of Dr. Crawford W. Long's priority. Much is said about the connection between Morton and Dr. Horace Wells, his dentist associate and classmate, and Wells' experiments in denistry with nitrous oxide, and it is admitted that Morton conceded that Dr. Charles T. Jackson, his old preceptor, "had prior knowledge of the work" and was besought by Morton to allow his name to be used in his joint application for a patent. But the fact is not emphasized that this patent was not for the use of pure ether, but for a compound in which ether was disguised with aromatic oil, under the name of "Letheon." Is it a wonder, then, that Dr. Charles T. Jackson who was the brains of the partnership in "Letheon," the one who had conceived the idea of the use of ether, in 1846, and disclosed it to Morton, who, otherwise would never have dreamed of its use, should have felt outraged when Morton attempted to palm off the discovery as his own to the surgeons of the Massachusetts General Hospital? Dr. Jackson must have conceived that he was dealing with an imposter, for he promptly took steps to assert his own priority. This he did in a letter to the French Academy of Sciences.

The whole conduct of Morton tended to show, and it was probably the fact, that his motive in applying to the surgeons of the General Hospital, was not to disseminate "knowledge of the discovery," but was done to gain glory at the expense of Jackson's discomfiture, and in retaliation for Jackson's attempt to assert his own priority in the letter to the French Academy. It is little wonder that Morton's conduct in this connection, and in his attempt to sell his Letheon to charitable hospitals, brought discredit to his name, and subjected him to the adverse criticisms of his contemporaries. If there be any credit in the conduct of those who acted with Morton, it should go to the surgeons of the Massachusetts General Hospital who promptly made known the results of their experiments.

But it must be remembered that more than four years before 1846 (not two, as stated by Dr. Smith) Dr. Crawford W. Long's discovery was known by the physicians of Northeastern Georgia, and Dr. Long was continuing its use, openly, during these transactions in Massachusetts.

Dr. Long was a gentleman of retiring disposition throughout his life; he never sought to glorify his own achievements. His only thought was that he should be remembered as a benefactor of mankind in this connection.

It seems very strange that there should be writers who still advocate the claims of Morton to priority, when Morton himself confessed Jackson's priority, and when affidavits in abundance were filed that he, time after time, admitted that priority. And this being true, the claims of Dr. Long should be beyond controversy, when Dr. Jackson after full investigation in Dr. Long's office at Athens, Georgia, in 1854, admitted Dr. Long's priority to himself by more than four years, and returned to Boston to publish the acknowledgment in the *Boston Medical Journal*, in 1861.

Dr. Charles T. Jackson was one of the most distinguished chemists of his day, and while asserting his own claims of discovery as against Morton for any originality in the use of ether as an anæsthetic, appealed to the courts about their patent interests. Those who wish legal proof that Morton disclaimed any originality in the matter for himself, will find many affidavits to this effect in Vol. 17, of *Littell's Living Age*, page 560. So, why should any doubt remain that Dr. Long was the true and original first discoverer of Ether-Anæsthesia in surgery when Dr. Jackson admitted his claim, and when such an abundance of sworn testimonies is in the hands of his daughter, Mrs. Frances Long Taylor, of Athens, Georgia, to verify all the particulars of the employment of ether in a surgical operation, by her father, at Jefferson, Jackson County, Georgia, March 30, 1842, four and one half years before either Morton or Jackson ever essayed its surgical use.

Anyone who desires to see all of the original affidavits and the original daybook accounts may find them in the hands of Mrs. Taylor, showing the extirpation of a tumor from the back of the neck of James Venable, at Jefferson, March 30, 1842. Some of them may be briefly summarized as follows:

First—The affidavit of Mr. Venable that the operation was performed by Dr. Long March 30, 1842, under ether and that it was painless.

Second—The original entry in Dr. Long's account book, as follows:

JAMES VENABLE TO DR. C. W. LONG, DR.

1842		
January 28	Sulphuric Ether	.25
March 30	Ether and Extracting Tumour	2.00
May 13	Sulphuric Ether	.25
June 6	Extracting Tumour	2.00

The above and all the following can be found in photographic copy form in Dr. Allen J. Smith's paper in *Old Penn*, October 2, 1915, entitled "Documentary Evidence bearing upon Dr. Crawford W. Long, Discoverer of Ether-Anæsthesia."

Third—Affidavit of Dr. Edmund S. Rawls of Rome, Georgia, who, in 1842, was present at the operation on Venable and who testified, positively, to the facts.

Fourth—Affidavit of William H. Thurmond, who was also present at the above operation and swears that he saw it painlessly performed by Dr. Long while the patient was unconscious under ether.

Fifth—Affidavit of James E. Hayes, who swears he witnessed a second such operation on Venable by Dr. Long on June 6, 1842.

Sixth—Sworn statement of Sabry Hemphill that Dr. Long operated on a negro boy belonging to her, cutting off a toe, while the patient was under ether, July 3, 1842, and that he suffered no pain.

Seventh—Mary Vinson of Jackson County, Georgia swears that Dr. Long cut out three wens from her head in the summer of 1843. One operation under ether gave no pain, but she suffered severely while the other two operations without ether were performed. This is also certified by Mrs. Vinson's husband, William Vinson, who was present.

Eighth—Mrs. Emma H. Carlton swears that Dr. Long, December 1844, advised her husband, Dr. Joseph B. Carlton, to use ether in his practice, and while she was that year on a visit to Jefferson with her husband, he extracted the tooth of a negro boy in Dr. Long's office, under ether, without pain, and that the fact of Dr. Long's using ether in surgery was frequently spoken of in the County Jackson at that time, and was quite notorious.

Ninth—G. L. Thompson testified that he was present and saw Dr. Long cut off the finger of a negro boy, then the property of Ralph Bailey, Sr., under ether, without pain, in the year 1845.

Tenth—Affidavit of Mary E. Ware of Floyd County, Georgia, that he extracted one of her teeth, while under ether, painlessly in 1846.

There are many other testimonials of such a character.

Those who may be interested to investigate further the authenticity of Dr. Long's claim may refer to the writings of the following authors who have made exhaustive studies in this controversy and have written in Dr. Long's favor, to wit:

Dr. Marion Sims, New York City.
Dr. L. B. Grandy, Surgeon, U. S. A., of Atlanta, Ga.
Dr. Marcus Taylor, Mississippi.
Dr. J. McF. Gaston, Atlanta, Ga.
Dr. Hansell Crenshaw, Atlanta, Ga.
Dr. Isham Goss, Athens, Ga.
Dr. George Foy, Dublin, Ireland.
Dr. Dudley Buxton, London.
Dr. Hugh H. Young, Baltimore, Md.
Dr. E. M. Magruder, Charlottesville, Va.
Dr. Allen J. Smith, University of Pennsylvania.
Dr. Charles Johnson, Champlain, Ill.
Dr. J. Wesley Long, Greensboro, N. C.
Dr. Paluel Flaggs, New York City.
Mrs. Frances Long Taylor, Athens, Ga.
Dr. Joseph Jacobs, Atlanta, Ga.

Will any fair investigator wish further proof of Dr. Long's priority, in view of the above, and when it is remembered that Alexander Hamilton Stephens suggested his name, in 1879, as one of Georgia's representatives in the National Hall of Fame; that the General Assembly of Georgia selected Dr. Long's name with that of Mr. Stephens for this honor, and that after twenty years' notice to the world by a Public Act, the state dedicated a statue of Dr. Long in that Hall without protest, and it was accepted by the formal unanimous vote of the United States Senate on the 30th of March 1926? This installation was made by authority of a former resolution of the Senate in which Senators from New York, Pennsylvania and Georgia discussed the various claims. If the champions of Morton had a case, then was the time for its presentation. As no issue was then made, should they not "forever after hold their peace?"

PHARMACEUTICAL EVENTS ABOUT 1776.

BY OTTO RAUBENHEIMER.

My historical records collected during the past twenty-six years date back to 1800. In the compilation of my paper "Pharmaceutical Events in 1776, a Sesqui-Centennial of Pharmaceutic Events," I had to look further back and during this research came across numerous data several years before and after 1776, which are too valuable to be lost. Therefore this present paper on the Events *about* 1776.

The arrangement differs somewhat from that of my usual annual historical paper, and is as follows:

Pharmacists, Chemists and Physicians tabulated as to countries.
Botanists and Naturalists.
Quinologia.
Born about 1776.
Died about 1776.
Events Pharmaceutical, Chemical and Medical arranged in chronological order from 1765 to 1787.
Conclusion.

PHARMACISTS, CHEMISTS AND PHYSICIANS.

Those prominent in their respective professions and active or alive about 1776 are herewith listed according to countries:

DENMARK.

1740–1800, Prof. Mathias Saxtorph.

FRANCE.

1700–1781, Henri Louis Duhamel.
1707–1788, Louis Le Clerc.
1712–1781, Exupère Joseph Bertin.
1712–1789, Angelique M. Leboursier du Coudray.
1718–1784, Pierre Joseph Macquer.
1725–1797, Pierre Bayen.
1728–1803, J. Fr. Demachy.
1728–1804, Antoine Baumé.
1730–1785, Mlle. Biheron, anatomical modeller.
1731–1799, L. Cl. Cadet de Gassicourt.
1732–1810, Jean Discement.
1733–1816, Guyton de Morveau.
1737–1813, Ant. Aug. Parmentier.
1738–1814, Joseph Ignace Guillotine, M.D. and inventor of the decapitating machine.
1742–1806, Nicolas LeBlanc
1743–1793, Jean Paul Marat, M.D., and revolutionist.
1743–1794, Antoine Laurent Lavoisier.
1744–1829, Jean Baptiste de Lamarck.
1745–1838, Pierre Louis Dulong.
1748–1822, Claude Louis Berthollet.
1749–1827, Pierre Simon Laplace.
1755–1809, Antoine Francois Fourcroy.
1755–1826, Joseph Louis Proust.
1755–1836, André Marie Ampère.
1756–1832, Jean Antoine Chaptal.
1763–1829, Louis N. Vauquelin.
1769–1832, George Cuvier.

SWITZERLAND.

1708–1777, Albrecht von Haller, the master physiologist of his time.
1734–1815, Friedrich Anton Mesmer.

HOLLAND.

1722–1789, Peter Camper, anthropologist and professor of anatomy at Amsterdam.

GERMANY.

1692–1777, Johann Heinrich Pott.
1705–1780, H. David Glaub.
1709–1782, Andreas Sigismund Marggraf, the last German phlogistonist.
1722–1783, Jacob Reinhold Spielmann.
1725–1799, Dr. E. G. Kurella.
1726–1787, Johann Rempf.
1727–1759, Johann Gottfried Zinn.
1732–1778, Karl Gottlieb Wagler.
1732–1800, Joh. Christ. Wiegleb.
1739–1808, Heinrich Aug. Wrisberg.
1743–1817, Heinrich Martin Klaproth.

1744–1816, Lorenz von Crell.
1748–1804, Johann F. Gmelin.
1749–1829, Carl Gottfried Hagen.
1749–1832, Johann Wolfgang Goethe.
1751–1819, Johann Friedrich Westrumb.
1753–1821, Franz Carl Achard.
1755–1809, Joh. F. A. Goettling.
1755–1843, Sam. Christ. F. Hahnemann.
1756–1849, Ernst Wilhelm Martius.
1757–1804, Joh. Tobias Lowitz.
1762–1807, J. B. Richter.
1762–1807, Valentin Rose, Jr.
1762–1836, Christ. Wilhelm Hufeland.
1770–1837, Joh. B. Trommsdorff.
1772–1849, Joh. Gottfried Rademacher.

SWEDEN.

1735–1784, Tobern Olaf Bergmann.
1742–1786, Karl Wilhelm Scheele.
1744–1820, Sam. G. Hermelin.
1745–1818, Johann Gottlieb Gahn.

GREAT BRITAIN.

1700–1778, Sam. Sharp.
1707–1779, Nathan Alcock.
1710–1790, William Cullen.
1710–1801, William Heberden.
1712–1780, John Fothergill.
1713–1788, Percival Pott.
1718–1783, William Hunter.
1721–1770, Mark Akenside.
1728–1774, Oliver Goldsmith.
1728–1793, John Hunter.
1728–1799, Joseph Black.
1728–1813, Charles White.
1731–1802, Erasmus Darwin.
1731–1810, Henry Cavendish, the wealthiest of all scholars, and the most scholarly of all the wealthy!
1733–1804, Joseph Priestley.
1733–1812, Richard Kirwan, the last of the phlogistonists.
1733–1816, Thomas Denman.
1733–1817, Alexander Monro Secundus.
1735–1788, John Brown.
1736–1801, Thomas Fowler.
1736–1819, William Hey.
1740–1804, Thomas Percival.
1741–1799, William Withering.
1744–1815, John Coakly Lettsom.
1745–1800, William Cumberland Cruikshank.
1749–1823, Edward Jenner.
1752–1808, John Sheldon.
1754–1829, Lewis Marie Smithson.
1758–1822, James Gregory.
1760–1808, Thomas Beddoes, the discoverer of Humphrey Davy.
1766–1829, W. H. Wollaston.
1766–1844, John Dalton.

ITALY.

1711–1778, Laura Maria C. Bassi-Varati.
1725–1818, Leopold Marco Antonio Caldani.
1728–1797, Simon André Tissot.
1729–1799, Lazaro Spallanzoni.
1730–1805, Abbé Felix Fontana.
1737–1798, Luigi Galvani, at first nicknamed "Frog's Dancing Master."
1745–1827, Allessandro Volta.
1747–1832, Antonio Scarpa.
1752–1815, Paolo Mascagin.

UNITED STATES.

1706–1790, Benjamin Franklin.
1708–1779, Thomas Cadwallader.
1725–1793, James Hutchinson.
1735–1789, John Morgan.
1736–1808, William Shippen.
1741–1825, Benjamin Rittenhouse.
1743–1823, William Aspinwall.
1743–1824, Thomas Henderson.
1744–1825, Charles Marshall.
1745–1813, Benjamin Rush.
1750–1829, Aaron Dexter.
1753–1814, Benjamin Thompson Count Rumford.
1754–1846, Benjamin Waterhouse.
1754–1844, Dr. James Thacher of American Dispensatory fame.
1759–1826, Sam. Powell Griffitts.
1759–1839, Judge Thomas Cooper.
1760–1818, Dr. Caspar Wistar.
1764–1831, Dr. Sam. Latham Mitchill.
1768–1836, Elizabeth Marshall.
1768–1837, Dr. Philip S. Physick.
1769–1835, Dr. David Hosack.
1770–1809, James Woodhouse.
1770–1845, Joseph Cloud.
1771–1814, John Maclean.
1773–1825, Adam Seybert.
1773–1864, John Redman Coxe.
1775–1821, Dr. Lyman Spalding, the Father of the U. S. P.

BOTANISTS AND NATURALISTS.

Around 1776 there lived some of our greatest botanists and naturalists as can be seen from the following list, representing all countries, including the United States.

1699–1777, Bernard Jussieu, Fr.
1701–1774, Charles Marie de la Condamine Fr. mathematician and naturalist.
1707–1778, Carl von Linné, Sweden.
1716–1795, Don Antonio d'Ullon, Sp. explorer.
1720–1792, Paul H. Moehring, German botanist and ornithologist.
1727–1817, Nicolas Joseph V. Jacquin, Fr.
1739–1823, William Bartram, Am.
1740–1829, J. J. Molina, Chil. nat.
1741–1799, William Withering, Eng.
1742–1795, Friedrich Ehrhardt, Ger.
1742–1821, Andreas Johann Retzius, Ger.
1743–1828, Carl Peter Thunberg, Swed.
1744–1829, Jean P. A. de Lamarck, Fr. nat.
1746–1802, André Michaux, Fr. bot. in U. S.
1748–1831, Chr. E. von Weigel, Swed.
1748–1836, Antoine Laurent de Jussieu, Fr.
1750–1816, Christ. Conrad Sprengel, G.
1754–1821, Louis Claude Marie Richard, Fr.
1755–1828, J. Ch. Wendland, Ger.
1759–1828, James Edward Smith, Eng.
1762–1823, Alex. D. Koehler, Ger. bot. in America.
1765–1812, Carl Ludwig Willdenow, Ger.
1769–1825, J. E. Christ. Ebermaier, Ger.
1770–1836, Christ. H. Person, Dutch.
1770–1855, Francois André Michanx, Fr. bot. in U. S.
1770–1829, Giuseppe Raddi, Ital.
1773–1859, Thomas Horsfield, *Am.* bot. in Java.
1774–1820, F. T. Pursh, Ger. bot. in U. S.
What an array of immortal names!

QUINOLOGY.

It was during the life of the above men that botany was reconstructed and systematized and shaped into an exact science. From the middle to the end of the 18th century special attention was paid to cinchona as can be seen from the following short account.

In 1735, a historic expedition was sent to South America by the Spanish government, composed of LaCondamine, Gordin, Ulloa and other "savants." In their report they protested against the habit of destroying the trees to obtain the bark, advising that new trees be planted. Even at such an early date they stated "Though the trees are numerous, yet they have an end."

In 1735, Joseph Jussieu, the botanist, visited Peru collecting specimens under an exploring expedition of the French and Spanish governments. In 1739 together with LaCondamine he visited Loxa for the first examination of the Loxa cinchona tree, remaining in South America after LaCondamine's departure. All in all Jussieu spent thirty-four years in laborious, self-sacrificing pioneering research to be at last robbed by a dishonest servant of his great collection of plants and specimens. In 1771 he returned to France, deprived of reason by the great loss.

Exportation of cinchona plants was naturally opposed by the Peruvian government, which was anxious to retain the monopoly of so important a product, but in 1743 LaCondamine attempted to transport young plants down the Amazon and then to Paris. The box containing these was washed overboard, but subsequent attempts were more successful and cinchona was cultivated in other parts of the world.

The first important publication on cinchona is the paper by Arrot read before the Royal Society in 1737 "Account of the Peruvian or Jesuits' Bark." Before that year no botanical history of the *Quinquinia* or *Arbor Febrifuga Peruviana*, as *Cinchona* was then called, is found worthy of attention.

In 1774, there was published in Edinburg "Dissertatio de Cortice Peruviano" by Thomas Balfour.

In 1784, Ralph Irving presented a dissertation which obtained the first prize given by the Harveian Society of Edinburg. "Experiments on the Red and Quill Peruvian Bark, with Observations on Its History, Mode of Operation and Uses."

This 101-page dissertation was dedicated to John Eliott, Esq., December 16, 1784.

John Rolph, M.D. was physician to Guy's Hospital, London. In 1794 he published a volume of 177 pages entitled "An Inquiry into the Medical Efficacy of a New Species of Peruvian Bark, Lately Imported into This Country under the Name of Yellow Bark."

The two most important early works on cinchona are: H. Ruiz: Quinologia, Madrid 1792. Supplement 1801. H. Ruiz and J. Pavon: "Flora Peruviana et Chilensis," 4 vol. 425 Plates, Madrid 1798–1802.

The above short account of the research on cinchona during the 18th century is again another proof of that interesting study "History of Drugs and Medicines."

BORN ABOUT 1776.

Some of our most celebrated pharmacists, chemists, physicians and scientists were born about this time. Their birth is herewith presented in chronological order:

1762, Richter, Val. Rose, Schrader and Hufeland.
1763, Vauquelin and Haenle.
1764, Dr. Sam. Latham Mitchill.
1765, Seguin.
1766, Dalton and Wollaston.
1767, Saussure and Doerffurt.
1768, Dr. Physick and Elizabeth Marshall.
1769, Jacques and Peschier.
1770, Trommsdorff, Bucholz, Best and Francois André Michaux.
1771, Bichat and McDonald.
1772, Broussais, Lampadius and Rademacher.
1773, Thomas Young, Boivin, Dr John Redman Coxe and Adam Seybert.
1774, Serullas, Biot, Robert Watt, Sir Charles Bell, F. T. Pursh and Dr. Lyman Spalding.
1775, Geiger, Gehlen and Juch.
1776, treated in a separate paper.
1777, Courtois, Thénard, Boullay, Oersted and d'Arcet.
1778, Davy, Gay-Lussac, Stromeyer and Humboldt.
1779, Berzelius.
1780, Doebereiner, Derosne and Robiquet.
1781, Struve.
1782, Duhamel.
1783, J. A. Buchner, Sertuerner and C. S. Rafinesque Schmalz.

DIED ABOUT 1776.

The following deaths occurred about this time.

1768, John Huxham and George Brandt.
1769, Claude L. Cadet de Gassicourt and Cartheuser.
1770, G. F. Rouelle and B. S. Albinus.
1771, Valentine Rose, Sr.
1772, Dr. Gerhard von Swieten.
1773, Nils R. von Rosenstein.
1774, Anna Morandi Manzolini, J. F. Henckel, Dr. Oliver Goldsmith and Charles Marie Condamine.
1775, Johann F. Meckel.
1776, treated in a separate paper.
1777, Johann Heinrich Pott, Joh. Andr. Cramer, Albrecht von Haller and B. Jussieu.
1778, Dr. William Brown, author of the first Pharmacopœia in America and Carl Linné.

EVENTS PHARMACEUTICAL, CHEMICAL AND MEDICAL ARRANGED IN CHRONOLOGICAL ORDER FROM 1765 TO 1787.

1765—Dr. John Morgan in his address "Discourse upon the Institution of Medical Schools in America," delivered at the Commencement of the College of Philadelphia, proposed the separation of pharmacy from medicine, the first step on record.
Medical Faculty of University Pennsylvania founded.
Philadelphia Medical Society organized.
Royal Veterinary College at Dresden.
National Veterinary College at Alfort.
Watt invents steam engine.
Fontana publishes memoir on viper poison.
1766—Cavendish discovers hydrogen.
New Jersey Medical Society founded.
1767—Torben Olaf Bergmann begins his classic work in analytical chemistry.
Pharmacy Law of Hesse-Cassel and of Erfurt, Germany.
Medical School of King's College (later

Columbia University) New York City.
Marggraf: Chymische Schriften (Berlin).
Influenza Pandemic in Europe.

1768—Scheele prepares tartaric acid.
Lavoisier elected member Academie des Sciences and appointed as one of the Ferme Générale.
Dr. David Jackson, father of Samuel Jackson, graduates in the first class of the Medical School, College of Pennsylvania, later the University of Pennsylvania.
G. F. Roessler introduces electric baths.
Dr. Heberden describes Angina Pectoris.
Elizabeth Marshall, first woman pharmacist in America, born.

1769—Scheele discovers composition of bone ash and prepares phosphoric acid therefrom.
Wiegleb recognizes an acid in sal acetosella.
Watt patents his steam engine.
Dartmouth College founded.
Medical Society of New York.
First Children's Hospital in Europe opened by George Armstrong.

1770—Frederick II sanctions the establishment of the "Schweizer Apotheke zum Roten Adler" in Berlin which, in 1814, was bought by J. D. Riedel.
Baumé established first sal ammoniac factory in France.
Lavoisier publishes the proof that water is not converted into earth by evaporation.
Priestley recommends rubber for erasers.
Wiegleb analyzes white precipitate.
Cotugno demonstrated albumen in urine.
William Brown, author of first Pharmacopœia in America, obtained M.D. degree in Edinburg.
First Medical Degree in U. S. conferred by King's College, New York City.

1771—Townsend Speakman's Drugstore established corner Market and Second Sts., Philadelphia.
Ernst Wilhelm Martius, father of the celebrated pharmacognosist, was apprenticed to the Wels-Weinl Hofapotheke in Erlangen.
Parmentier, then chief pharmacien at the Hotel des Invalides, wins the prize offered by the Academy of Besançon by suggesting to plant potatoes as the best means to avert a famine in France.
Marggraf precipitates a Lac by adding alum to extract of red madder.
Scheele prepares H. F. from Fluorspar.
Bellevue Hospital in New York founded.
Pulsatilla introduced by Anton Stoerck.
Roasted Chicory Root introduced as a substitute for coffee.
Linné knew 8551 species of plants.
Gaubius, in Leyden, crystallizes menthol from oil of peppermint and introduces Calumba and Lopez root into the materia medica.
First edition of the Encyclopedia Brittanica.

1772—Charles Marshall succeeds his father Christopher at Chestnut and Second Sts., Philadelphia.
Carl Gottfried Hagen succeeds his father in the Apotheke at Koenigsberg.
Rutherford discovers nitrogen.
Scheele discovers oxygen.
Priestley discovers nitrous oxide.
Price list of medicines (Taxe) issued in Denmark.
Medical Law in New Jersey.

1773—Bergmann analyzed tartar emetic.
Rouelle discovers urea.
Savary in Strassburg investigates sal acetosella.
Repeal of Law against sale of poppy capsules in France.
Guyton de Morveau introduced chlorine fumigation to remove the dead body odor from the church St. Médarde in Dijon.
John Walsh observes animal electricity.
Aqua Lauro Cerasi introduced into materia medica.
In France there was established the "Commission royale de medicine pour l'examen des remèdes particuliens et la distribution des eaux minerales."
American Medical Society in Philadelphia.
Medical Society of London.
First Insane Asylum in the U. S. in Williamsburg, Va.
Calumba recommended by Pereira.

1774—Priestley published his discovery of "Dephlogisticated Air" (O).
Priestley discovers ammonia gas.
Scheele discovers Cl, Ba and Mn.
Scheele prepares $KMnO_4$ and aldehyde.
Bergmann recognized fixed air (CO_2) as a weak acid. He names it "Luftgas."
The French pharmacist Pierre Bayen (1725–97) observed that the increase in weight by heating metals to form "Calces" is due to access of air.
Lavoisier repeats his experiment of calcining tin and reports that the gain of

weight is at the expense of the air and that the loss in weight of air equals the gain in weight of the tin.

Prof. J. W. Schroeder introduced Acorus and also Ledum palustre into materia medica.

Benjamin Jesty vaccinates against smallpox in Dorsetshire.

Dr. Abraham Chovet from Jamaica teaches anatomy in Philadelphia.

Dr. Robert James, London, originator of James' Powder, patented his "Analeptic Pill."

1775—Scheele discovers arsenic acid and prepares impure AsH_3.

Scheele prepares Na_2CO_3 from NaCl + PbO, but did not receive the prize offered by the French Academy of Sciences.

Scheele sublimes pure benzoic acid from benzoin.

Scheele received as "Studiosus Pharmaciae" by the Stockholm Academy.

Bergmann observes Acidum Coerulei Berolinensis (HCN).

Lavoisier decomposes fixed air (CO_2) into C and pure air (O).

Lavoisier defines oxygen.

Wiegleb finds that Stearoptenes of Volatile Oils differ from Camphor.

Volta invents the electrophor.

John Morgan appointed Director Surgeon-General of the American Army.

1776—These events are treated in a separate paper.

1777—W. Will obtained peonal, an aromatic Ketone in colorless crystals by the steam distillation of the Japanese plant Paeonia.

Lavosier describes the exchange of gases in respiration.

Scheele publishes Treatise on Air and Fire.

R. F. Wenzel establishes fundamentals of Stoichiometry.

John Howard's investigation of prisons and hospitals.

Army Veterinary School at Vienna established.

Frier's Drops (somewhat different from Friar's Balsam) patented in England.

William Shippen chosen Director-General of the American Army Medical Department.

1778—Dr. William Brown publishes the first American Pharmacopœia in Philadelphia.

Bergmann discovers Molybdenum and Tungsten.

Count Rumford investigates mechanical equivalents of heat. Chemische Journal established, continued as Crells Chem. Annalen.

Elvy publishes "Dictionaire Historique de la Medicine."

1779—Scheele discovers glycerin, which he named "Sweet principle of oils" in preparing Empl. Plumbi.

Ingen Housz discovers that plants give off CO_2.

University of Palermo, Sicily, founded.

J. P. Frank issues first system of public hygiene.

Mesmer publishes his memoir on "Animal Magnetism."

1780—Scheele prepares lactic acid.

Benjamin Franklin mounts bifiocal lenses.

American Academy of Arts and Sciences founded at Boston.

University of Muenster, Germany, inaugurated.

Oxford University establishes chair of clinical medicine.

1781—Cavendish accomplishes synthesis of water.

The name Oxygenium coined by Lavoisier.

University of Georgetown, D. C., founded.

Massachusetts Medical Society.

1782—Scheele discovers HCN.

Molina names "Peumus Boldus."

Carl Heinrich Heinitch establishes pharmacy in Lancaster, Pa. Still in existence and in the hands of descendants. According to a sign in the store the date is claimed to be 1780, but most records state 1782. Medical Department of Harvard University founded.

University of Innsbruck reduced to a Lyceum by Joseph II.

1783—Surgeons separated from Barbers in Austria.

Royal Society of Edinburgh publishes *Transactions*.

1783-85—Lavoisier analyzes water and overthrows Phlogiston Theory.

1784—Scheele prepares citric acid.

Cavendish discovers hydrogen.

Leblanc invents soda process.

Goethe discovers intermaxillary bone.

Cotugno discovers cerebro—spinal fluid.

Royal College of Surgeons in Ireland.

Allgemeines Krankenhaus in Vienna established.

First daily newspaper in the United States published: Pennsylvania Packet or Daily Advertiser.

University Lemberg, Galicia, founded.

1785—Scheele prepares gallic acid.
Fowler's solution originated.
Withering's treatise on Foxglove published.
Sir Gilbert Blane publishes treatise on naval medicine.
Josephinium established at Vienna.
Chair of Anatomy established in University of Dublin.
University of Georgia founded.

1786—Odier introduces bismuth subnitrate into materia medica.
Fourcroy and Thouret discover Adipocere.
John Hunter publishes treatise on venereal disease.
Lettsom describes drug habit and alcoholism.
Royal College of Physicians, London, publishes transactions.
Berthollet adopts Lavoisier's Combustion Theory.
Philadelphia pharmacy for the poor established.

1787—Berthollet prepares $KClO_3$, named "Sel de Berthollet."
Guild of Bathkeepers abolished in Wuerzburg.
Fourcroy and de Morveau adopt Lavoisier's Theory.
College of Physicians in Philadelphia founded.
Dr. Joh. David Schoepf published in Erlangen: *Materia Medica Americana. it.*

CONCLUSION.

If this paper will arouse a little more interest in that much neglected study of "Historical Pharmacy," then the author is well paid for his trouble.

It was the celebrated pathologist Rokitansky who is responsible for the expression: "An dem Lichte der Alten sollte die Jugend ihre Fackeln entzuenden," which freely translated means: "The deeds of our forefathers should inspire the younger generation."

By all means the younger generation of pharmacists needs this inspiration!

BILL FOR PROTECTING MERCHANDISE PRICES OUTLINED BY CONGRESSMAN KELLY.

"The Seventieth Congress will enact into law a fair trade bill, assuring the public honest merchandising, along the lines of House Bill No. 11, but in amended form so as to embrace a substitute agreed to by members of the House Committee on Interstate and Foreign Commerce of the Sixty-ninth Congress," Representative Kelly of Pittsburgh, Pa., predicted orally on May 21st.

"I introduced in the Sixty-ninth Congress," he said, "a measure (House Bill No. 11) to permit voluntary contracts between independent manufacturers and independent distributors requiring a uniform price. Hearings were held before the House Committee on Interstate and Foreign Commerce and subsequently an unofficial draft of proposed committee amendments was printed for the information of the Committee. I have accepted these amendments and gladly so because they simply clarify the purpose of my House Bill No. 11. At the beginning of the Seventieth Congress, next December, I shall introduce my bill in the amended form and I believe it will be enacted into law. It will be known as the Fair Trade Bill and its purpose, in brief, will be to assure honest merchandising.

"The problem of protecting the price on standard trade-marked articles in competition with other articles of the same class is the biggest question before American business. Granting the fight to the manufacturer of such a product is the greatest blow which can be struck against monopoly. The Standard Oil Company, the Tobacco Trust and other great combinations won their control by price cutting. They slashed rates until competitors were eliminated and then they raised the prices to recoup all losses. This same practice is used by great retail establishments in luring customers with the idea that all their goods are sold at bargain rates on standard trade-marked articles. Of course that is impossible and extortionate profits are made on unnamed and unidentified goods. The public pays the full cost of such practices. Fair competition is always in the public interest."

ACTIVITIES OF W. J. M. GORDON.*

BY JOHN URI LLOYD.

May I not repeat that Mr. Gordon practically introduced glycerin to the Pharmacopœia, that he made a great success of this industry, being in 1864 the only manufacturer of glycerin in the Middle West, that his success led him to establish a factory devoted to its manufacture, and that the fortune he made thereby was largely swept away by reason of changes in business methods, wherein, grasping their opportunities, soap and candle makers turned their attention to the by-product of their business, making it impossible for Mr. Gordon to obtain his crude material (sweet water) in America. Depending upon crude glycerin from abroad, chiefly Germany, in a hopeless effort to continue in competition with the new order of things, he was followed by disaster after disaster, as related herein.

Establishment of "W. J. M. Gordon and Brother, Pharmaceutists and Manufacturing Chemists." Cor. 8th St. and Western Row (now Central Ave.) Cincinnati, Ohio.

But not without a struggle was he overwhelmed. Ever alert in action, his ambition being to be of service to American pharmacy as well as to himself, he turned his thoughts in other directions, in which his name is now scarcely known, outside the recollections of a very few who yet live. Let me continue with a brief account of his bromine experience.

Bromine was discovered by Balard in 1826, only thirty-six years before Mr. Gordon became active in the glycerin direction. In 1846, a Mr. Alter established the fact that bromine was a constituent of certain salt waters of America, especially those of Natrona and Tarentum, Pennsylvania. Later it was also found in the mother liquors of the salt works along the valleys of the Ohio and Kanawha Rivers, as at Pittsburgh, Pomeroy, Syracuse and Mason City. In 1860, bromine was but little known, and was but little used in medicine or for scientific purposes.[1]

About this time came the record-making articles of Professor Roberts Bartholow, M.D., of Cincinnati, who became conspicuous throughout the United States, by his contributions on the therapeutic uses of the bromides. At that date, Bartholow was in close touch with Mr. Gordon. The writer of these lines (John Uri Lloyd), then an apprentice with Mr. Gordon, was a student in Bartholow's special class.

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* Continued from p. 1120, JOUR. A. PH. A., December 1925. Read before Section on Historical Pharmacy, A. PH. A., Philadelphia meeting, 1926.

[1] Historical data are from Thorpe's *Dictionary of Applied Chemistry*.

Just before this, came the utilization of the mother liquors of the Stassfurt potash industry, by Mr. A. Frank, previous to which bromine had sold at an exceedingly high price, and was very impure. Following came the discovery of bromine in the "bittern" of the salt work of the Ohio, notably in Pomeroy and its vicinity. Who first established its presence there is to me unknown, but from near its very start Mr. W. J. M. Gordon, because of his connection with Bartholow as well as his watchful interest in pharmaceutical discoveries, became concerned. In connection with his glycerin industry, he entered the salt-works field of bromine, about 1865.

Very crude was the apparatus then used, and very wasteful was the process. Owing to fear of metal contamination, the apparatus was made of wood, with sandstone stills. The crude bromine produced was quite impure, the impurities being separated therefrom by manufacturers of the bromides.[1]

In 1885, a young man from Pomeroy, Mr. Charles C. Seebohm, attended the Cincinnati College of Pharmacy, where I then taught pharmacy. At my request, he wrote a description of the bromine method of manufacture, which he accompanied by illustrations of the apparatus then in use. Even at that late date, the distilling apparatus was very crude, being "rude stone chambers hewn out of blocks of native sandstone."

Mr. Gordon thus became renowned in Cincinnati and elsewhere as first hand for supplies of bromine and the bromides. The principal package of bromine was then the quart, glass-stoppered bottle, in which the product was shipped from the bromine works to the manufacturers of bromides, of which Gordon then made a feature in his Cincinnati laboratory. Probably because of his efforts, about 1868, the price of bromine broke, even in Germany, Gordon shipping large quantities of potassium bromide to that country. In this came a great business disaster to Mr. Gordon, just antedating his glycerin troubles. The return to him of a large consignment (or consignments) of potassium bromide that had been refused entrance to Germany on account of impurities contained therein, distressed him mightily. Whether there was a competitive business as well as a scientific one, matters little. Gordon's reputation as a potassium bromide manufacturer was wrecked. The manufacture of bromides passed altogether into the hands of other well-known manufacturers of chemicals, in America.

Not without a struggle did Mr. Gordon give up in the bromide direction. He turned his attention to the incoming salt works in Michigan, hoping thereby to retrieve what he had lost, but without avail. The details of his efforts in that field are to me practically unknown.

Strange, is it not, that this pharmacist, whose establishment was second to none other (or at least to but one) in Cincinnati (see illustration) should, in needless enthusiasm, have gone outside the apothecary's business, in these two very conspicuous directions, in both of which he was dependent for his crude material supplies upon others who were alert for opportunities. These supplies being debarred him, after he had pioneered an industry, disaster followed. But the story of his misfortunes is not yet finished.

When natural gas was discovered, or at least before it became very important,

[1] See *American Druggist*, July 1884, and PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1885, pp. 223–225.

Gordon conceived the idea of making lampblack by the incomplete combustion of natural gas. Possibly the idea came to him from the outside, possibly he was himself the originating pioneer. At any rate, he entered into the lampblack industry, in competition with the product, being made then, chiefly from rosin. Whether it was because of incomplete processes, or by reason of mismanagement, matters little. He piloted the way to great after-opportunities, in which it was understood that fortunes were later made, but by others than himself.

Came then another, and a very black disaster it was to Mr. Gordon, whereby his now attenuated fortune was wholly swept away, together with that of his brother, O. F. Gordon. They conceived the idea of making wood alcohol, acetic acid, the acetates and other by-products of the destructive distillation of wood. A plant was established on the banks of the Ohio River above Cincinnati, opposite the suburb, Columbia. A large boiler was installed under which a fire could be made. Pipes were affixed thereto, leading to various tanks and containers. The boiler was filled with cord-wood, willow and white poplar being preferred. The industry thus established in a very crude way gave good promise, the charcoal remaining in the boiler being sufficient, in the opinion of Mr. Gordon, to pay all expenses. Very distinctly visualized in my memory is this crude plant. Whether the industry proved altogether a failure or not, or whether it was sold and the right of manufacture transferred elsewhere, is to me unknown. At any rate, Mr. Gordon, for a considerable time, was afterward concerned in the sale of wood alcohol made elsewhere.

Strangely enough, at the very time of these adventures outside the field of an apothecary, Mr. Gordon let slip an opportunity, strictly pharmaceutical, that came within his very grasp. In 1865, a material that then seemed likely to be of as little concern as was the least of many products of the vegetable kingdom then under process of manipulation in his laboratory, was introduced by a man named Pond, as "Pond's Extract of Hamamelis." Mr. Gordon was offered the purchase right to its manufacture, but declined. Mr. Hearst, a young man then traveling for Gordon, visioned the opportunity it presented, purchased the right to the manufacture of "Pond's Extract of Hamamelis," and made thereby a fortune. The detailed story of that drug, which dates back to its use by the American Indians, antedating the arrival of the white man, is of exceeding interest. This, however, out of place here, I have fully recorded in my unpublished notes in the history of "Witch Hazel."

Summing it all up, whoever will review the activities of this pharmacist-apothecary of Cincinnati and his contemporaries, will probably discover that Mr. Gordon was typical of the self-sacrificing, ambitious, visionary, pioneering apothecaries of old, who, having served well their times, have been brushed from sight in the passing along, by those curious seemingly unnatural bedfellows, the ultra-scientific and the commercial worlds.

May not a great lesson, applicable to parties establishing the values of remedial agents, wherein they depend for crude materials upon those who may be themselves concerned in that direction, be drawn from the failures of Mr. Gordon? Is not "Big Business" still alert to its opportunities? Does not the motto "*Consider well the end reaction*" still apply to him who discovers or develops anything useful?

PHARMACY*

BY S. W. LEIDIG.

The antiquity of pharmacy is attested by the fact that about the time when Moses had arrived at the age of manhood an Egyptian scribe, whose name is unknown, recorded on a roll of papyrus a number of rules and recipes which, in some respects, do not seem alien to these ultra-modern times.

For several thousand years the pharmacist has been recognized as the physician's chief aide, and as far back as the many-wived reign of Henry VIII we find such a preachment as the following, written by the cousin of one of that monarch's consorts:

> "The apothecary must first serve God; foresee the end, be cleanly and pity the poor. His place of dwelling and shop must be cleanly, to please the senses of all. His garden must be at hand, with plenty of herbs, seeds and roots. He must read Dioscorides. He must have his mortars, stills, pots, filters, glasses, boxes, clean and sweet. He must have two places in his shop, one most clean for physic, and the base place for chirurgic stuff. He is neither to decrease nor diminish the physician's prescription. He is neither to buy nor sell rotten drugs. He must be able to open well a vein, to help pleurisy. He is to meddle only in his own vocation, and to remember that his office is only to be the physician's cook."

James Tagree was classified as a pharmacist in 1703; his shop was in the thrifty village of New York, at the mouth of the Hudson, and he was the first in this country to be designated—the business of drug dispensing was standing on its own legs, and they were fairly steady and reliable legs at that—black cats and hoot-owls and like impediments had been shown the door.

About that time the only other legally recognized pharmacist in the Province of New York was Governor Hunter, who administered the affairs of the colony from 1709 to 1719. Meantime, in 1706, the Van Burens started pharmacies at New Brunswick, N. J. and Philadelphia. Their most famous medicinal product—the "Red Drop"—held its popularity well into the nineteenth century. About that time also a certain Manhattan merchant, who sold crude drugs, was arrested for offering colored sawdust as rhubarb! By the time the Declaration of Independence had become effective, at the close of the Revolutionary War, there were perhaps twenty apothecary shops in Philadelphia, with Christopher Marshall's "At the Sign of the Golden Ball," established in 1729, outranking all the others.

In the nearly two hundred years that have elapsed, nothing has undergone greater changes than the average pharmacy, or drug store. Even in 1857, no one ever thought of going to a druggist's for anything which did not, in some way, have to do with the tendency of the human machine to get out of order. In those "good old days" there were some pharmacists who would not even sell eau de cologne except on the doctor's order. One can hardly appreciate the vast distance that separates 1857 from 1926, when measured by what has taken place in this line of activity. The modest shop, with gilded pestle and mortar swinging over the entrance and multi-colored globes serving as sole window decoration, has given way, in our so-called march of progress, to a veritable jazz palace, in

* Read before Section on Practical Pharmacy and Dispensing, A. PH. A., Philadelphia meeting, 1927.

many instances. To-day we have many drug stores in which drugs appear to play so small a part as to be almost nil. Some of these institutions seem to emphasize everything but drugs.

Doubtless this new kind of drug store—the sort which stresses everything but drugs—has come as an answer to a public demand. That is the real reason behind many of our ultra-modern developments, and so long as the people seem to want them, we give them to the people. At the same time it must be remembered, that there rests on us a responsibility to give the people what they need, as well as what they want.

However, in this day of an entirely new kind of drug store, we can remain true to the highest ethics, and produce a place where members of the medical profession may, at the same time, find high and constant regard for their time-honored code. It is necessary to modernize in many directions, but the wise druggist is the one who sees to it that such improvements do not entirely cover up the basic purpose and meaning of the business he is conducting.

The best type of modern drug store does not eschew the soda fountain and handsome or even showy equipment, but at the same time, it does not depend upon these to give it place and standing in the community. Its owner remains faithful first to the health needs of those who patronize the store, and never is unmindful of the fact that the reputable physician is his most valuable ally.

If the store has the advantages of a laboratory department in which certain preparations are skillfully compounded, the proprietor sees to it that such of these as appertain to treatment of involved conditions requiring skilled diagnosis are put up and sold only for prescription use, and not indiscriminately passed out to every one who details what may or may not be true symptoms. This is a feature which never can fail to secure the confidence of the medical profession.

This best and most useful type of drug store does not have to do with any but the most competent pharmacists in its prescription department, and it demands trained and even skilled help in its other selling departments. With so many mediums for help or harm within its scope the owner cannot afford to take any risks.

The pharmacy, first of all, should be a medical service station, and all other departments should be attuned to this purpose. The store should by its equipment and the attitude of its staff impress those who come in with the purpose of the establishment, to minister to the needs of its patrons, and the staff must give due consideration to their wants and their fancies. But to reverse this order and play first to the fancies is not the goal that should be sought.

Conservation of health and lessening of disease is the chief purpose of the drug store that serves the best interests of the public.

CONSOLIDATION OF FIVE CHAIN DRUGGISTS IN EGYPT.

It is reported that a consolidation of five chain druggists with an authorized capital of 274,000 Egyptian pounds is taking place in Egypt. The organization will be controlled by Heppels (Ltd.) of London, which, according to previous reports, had contracted in 1926 to act as sole buying agent for the "Drug Stores of Egypt." This new company known as the Societe Anonyme Drogueries d'Egypte, announces plans to operate 36 stores and anticipates an average annual profit of 30,000 Egyptian pounds. (Cable from Commercial Attache James F. Hodgson, Cairo.)

STUDENT HEALTH SERVICE AT PURDUE UNIVERSITY.*

BY MARGARET S. KLEMME.

A student entering Purdue University pays an annual fee of $4.00 which entitles him to free medical examination, any operations, ten days in the hospital and all prescriptions.

In charge of the medical work is Dr. O. P. Terry. One doctor and a nurse assist him. A secretary takes care of all records and excuses. They occupy a suite of seven rooms which are well lighted and contain equipment superior to that found in the average physician's office.

Any major operations or those necessitating skill beyond that of the ordinary physician are done by specialists. Hospital cases may be sent to any one of the hospitals in the city, there being no University hospital.

The Pharmacy department employs a registered pharmacist for the purpose of filling and the supervision of the filling of the prescriptions written by the University physicians. The prescriptions written by other doctors may be filled free of charge, providing they are first signed by one of the University doctors.

The prescriptions are filled in a laboratory which contains equipment found in a model drug store.

The pharmacist has one or two students of the graduating class in Pharmacy to train in the art of compounding and dispensing. Some time during the year each member of the class has an opportunity to work with the registered pharmacist. After he has learned sufficient about the fundamentals he is allowed to fill some of the prescriptions written by the University doctors for the students. However, each prescription is carefully checked in order to avoid all mistakes. Neatness and accuracy are taught to be of the greatest importance.

The prescriptions are filled between eleven and twelve o'clock in the morning and between three and four in the afternoon. Those brought in before eleven o'clock are ready at twelve. Those brought in before three are ready at four o'clock. In case of an emergency or other necessity, the doctors write "Rush" on the prescription and it is filled immediately. The prescriptions are called for by numbers, the usual check system being used.

Last year we dispensed forty pounds of ointments, 25,000 capsules, sixteen (16) gallons of Syrup of Cocillana Compound, several gallons of Brown Mixture, Elixir Heroin and Terpin Hydrate, several pounds of acetylsalicylic acid and acetanilid.

Dr. Wilkins, the junior doctor last year, used a shorthand system for prescription writing, to which he and the prescription department had a key. He listed his pet medicines under Sedative, Respiratory, Gastro-Intestinal, Ointment and Miscellaneous Medicine. A prescription written:

	Called for,
℞.	Aspirin
Sed. 2	Phenacetin aa gr. xxxvi
(Signed) Wilkins	M. and ft. capsules No. 12
	Sig. One every 3 hours.

* Section on Education and Legislation, A. PH. A., Philadelphia meeting, 1926.

Another example:	Would be translated:	
℞.	Aromatic Spirit of Ammonia	℥ iv
Resp 6.	Syrup Cocillana Comp. qs ad	℥ ii
(Signed) Wilkins	Sig. ℥i q. 3 h.	

This system lessens the time spent in prescription writing and allows the doctor more time in which to study the patient. It is of the greatest help to the dispensing department because the various sedatives, respiratories and ointments may be made up by the dozens, gallons and pounds. It would have been impossible to have dispensed sixty to seventy prescriptions a day—which was the average for three weeks last winter—in the two hours' time, without some such system. Dozens of capsules and pounds of ointments were made up by some one student in the prescription laboratory and placed in the proper container ready for the label when needed in the Student Health Service prescription.

The Pharmacy Department is paid from the Student Health fund for the actual cost of the ingredients, which varies from year to year. The average cost of three to four hundred prescriptions is taken and a flat rate charged. This year they averaged eighteen (18) cents. Also the doctor's office is supplied with vaccines, ointments, alcohol and other medical necessities through the Pharmacy department, for which they pay actual cost.

The following report for 1925–1926 will show the value of the Student Health Service.

Number of students eligible to the service	3,465	In the hospital:	
Different students in the office	2,553	Medical cases	145
Physical examinations	1,813	Surgical cases	70
Inspection of students exposed to communicable diseases	379	Laboratory examinations	34
Different medical cases	4,445	In the hospital	945½ days
Different surgical cases	2,295	University paid	$2424.70
Care of medical and surgical cases, advice, excuses, etc., required office calls	17,445	Students paid	$1154.00
Prescriptions filled by the Pharmacy Department	5,382		
Prescriptions refilled by the Pharmacy Department	195		

The Student Health Service is a very good thing for any student. They will and do go to the University physicians, because of the fee which they have paid, quicker than they would to another doctor. In this way colds and other diseases may be checked before they get beyond control. Last winter there was not one case of pneumonia among the University students. There were cases of mumps, small pox, scarlet fever, besides the more common ailments such as colds and rheumatism, etc.

The service is a good thing for the Pharmacy Department because it gives the students practice in compounding and dispensing medicines which will be used. From their Freshman year they are taught that their preparations are to be used in the Student Health prescriptions. This prevents getting into the hit or miss habit of compounding which does happen when they know that the medicine goes down the sink, and for which habit some one, in the future, may pay.

INCOMPATIBILITIES OF PRESCRIPTIONS CONTAINING EPINEPHRINE HYDROCHLORIDE.*

BY MARVIN J. ANDREWS.

To the practicing pharmacist there is nothing more interesting than incompatibilities in prescriptions that are compounded and dispensed daily. Out of the general types of incompatibilities, and the many different sub-divisions of each type, only the incompatibilities of prescriptions dealing with epinephrine hydrochloride intended for local use will be discussed in this paper.

Epinephrine hydrochloride is used locally in solutions varying in strength from 1–1000 to 1–10,000 for ordinary application, in ointments, or in oily or saline solutions as sprays. It is also used hypodermatically in local anesthetics to prolong anesthesia.

The Pharmacopœia describes solution of epinephrine hydrochloride as a nearly colorless, slightly acid liquid gradually turning dark on exposure to air and light. When the solution has become brown in color or contains a precipitate it must be rejected, since this indicates decomposition.

It is the purpose in this discussion to bring out prescriptions that occur and reoccur in which the solution of epinephrine hydrochloride is decomposed, and is practically valueless from a therapeutic standpoint if allowed to stand for a period of from twelve to forty-eight hours.

℞

Liquor Epinephrinæ Hydrochloridi	ʒ i
Liquor Sodii Boratis Compositus q.s. ad.	ʒ iii

M. Sig. Use as a nasal spray every four hours.

The solution of epinephrine hydrochloride being an acid solution is neutralized by the alkalinity of Dobell's Solution. This solution liberates the epinephrine base and since it is a very dilute solution is gradually decomposed, turning to a reddish brown color, indicating the loss of therapeutic value.

℞

Solution of Epinephrine Hydrochloride	ʒ ii
Solution of Silver Nitrate 1%	ʒ vi

M. ft. sol.
Sig. One drop in each eye night and morning.

Solution of silver nitrate reacts with the solution of epinephrine hydrochloride precipitating the chloride as silver chloride. The epinephrine reduces a small portion of the silver nitrate to the metallic condition, and in turn the epinephrine is oxidized itself, thereby losing its therapeutic value.

℞

Liquor Epinephrinæ Hydrochloridi	ʒ i
Sodii Boras	gr. x
Aqua Destillata	ʒ vii

This solution can be prepared and dispensed clear, but if it stands for a period of more than twenty-four hours, the color of the solution will change from a

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Philadelphia meeting, 1926.

light yellow to a dark brown. This solution should be rejected if the full therapeutic effect is desired.

℞	
Adrenalin Inhalant	℥ ii
Menthol	gr. x
Petrolatum Liquidum q.s. ad.	℥ i
M. ft. Nebula.	
Sig. Spray nose and throat night and morning.	

Adrenalin Inhalant has as one of its chief ingredients adrenalin, which is not soluble in mineral oils. This prescription if compounded as it is written will precipitate if allowed to stand. However, this difficulty may be overcome by replacing the Liquid Petrolatum with a fixed oil such as olive oil.

In conclusion, if the physician persists in prescribing any of the above prescriptions he should be informed not to write for an alkaline solution containing epinephrine hydrochloride that would last longer than twenty-four hours.

In the first prescription containing epinephrine hydrochloride and Dobell's Solution—if several days' supply is desired—the physician should prescribe each in separate solution, or replace the alkaline Dobell's Solution with some acid solution.

The second prescription being a different type can be dispensed by replacing the solution of epinephrine hydrochloride with a solution of epinephrine nitrate, which will make a clear solution with the silver nitrate.

There are two alternatives in the third prescription, first to replace the sodium borate with boric acid, or, second, to dispense two separate solutions if an alkaline solution is desired.

The difficulty in the last prescription may be overcome by replacing the Liquid Petrolatum with either olive oil or expressed Oil of Almond.

601 Cathedral St.,
Baltimore, Md.

FLAVORING QUALITIES OF VANILLA TINCTURES.*

BY HAYWOOD M. TAYLOR AND R. A. KONNERTH.

There are many factors that enter into the preparation of a vanilla tincture of the highest flavoring qualities. The proper selection of the beans, the curing and drying of the beans and their treatment in process, together with subsequent aging and storage, all play an important part and should be given due attention. Believing that a summary of the literature on this subject is of sufficient interest to justify it we have made an exhaustive search and report it briefly in the following pages. For those who may be interested in going into the subject in more detail, an extensive bibliography is appended. For obvious reasons we have not adopted all of the recommendations made in the published literature in our experimental work as we were only interested in a comparison of the tinctures prepared from various beans and from different combinations of beans.

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* Section on Practical Pharmacy and Dispensing, A. Ph. A., Philadelphia meeting, 1926.

VANILLA BEAN.

1. *Selection of the Bean.*—C. P. Campbell (1) reports that Mexican beans give the best results, with Bourbon next and Tahiti beans last, and all authorities agree with this classification though some claim that under the proper conditions Bourbon beans give equally as good an extract (2). Blends of the two also give excellent results. Tahiti beans should never be used except in the cheaper extracts, and when used they require 10% more alcohol in the menstruum.

2. *Curing the Beans.*—The process (3) of curing vanilla beans as at present carried out is a long drawn out process and subject to many variations. Frank Rabak (4), U. S. Department of Agriculture, recommends curing the beans under standardized laboratory conditions according to the following method: The beans are immersed in water at 80° C. for a period of ten seconds at intervals of one half minute, for three successive times. They are then wrapped in woolen blankets and allowed to sweat for twelve days, after which they are wrapped in wax paper, and allowed to dry for twelve days. They are than well wrapped, placed in tight containers and allowed to dry for two months. This process gives a bean of exquisite aroma—deep brown color and fine texture. The extract made from these beans is far superior to that made from the ordinary cured bean.

3. *Drying the Beans.*—Schlotterbeck and Dean (5) have found that a better extract is obtained if the beans are first dried. This is best done by chopping the beans very fine with vertical knives and then spreading the chopped beans in thin layers on shelves in a small room through which a current of air at 50° C. is drawn. The loss of vanillin is negligible.

THE PREPARATION.

4. *Reducing to a Fine Powder.*—To obtain maximum extraction it is necessary that the beans be finely powdered. The temperature should be kept as low as possible during grinding. Vertical knives should be used to chop the beans as they cause no rise in temperature. After chopping, the beans are dried to constant weight and then powdered by means of water-cooled steel rollers.

5. *The Menstruum.*—Probably the best menstruum is either a 60% alcohol or 20% glycerin with 50% alcohol. When sugar is used it should be added to the percolate because it produces a cloudiness when mixed with the beans. Glycerin should be added to the menstruum because it serves to increase the color. Alkali may be added to the menstruum, but it is objectionable in that it is injurious to the odor and flavor of the extract, though it increases the color tremendously (6). Wilson and Sale (7) have tried out other solvents, such as isopropyl alcohol, ether, acetone and carbon tetrachloride but from a standpoint of aroma and flavor they recommend a neutral 65% alcohol. The preliminary removal of the oily matter in the beans is not recommended.

6. *Method of Extraction.*—There are numerous methods of extraction in use, the principal ones being (*a*) maceration and subsequent percolation, (*b*) the circulatory displacement method, (*c*) fractional percolation, (*d*) pressure, (*e*) agitation, (*f*) agitation after maceration, (*g*) hot percolation. Of these the circulatory displacement (8) method is probably the most satisfactory. The beans are suspended just below the surface of the menstruum. As the constituents of the beans are extracted the density of the menstruum increases—it sinks to the bottom

of the container and forces fresh menstruum up thereby setting up convection currents. The beans may be percolated afterward. The extraction is about complete in 3 months but the flavor continues to improve the longer the maceration is allowed to continue. In no case should the temperature be allowed to rise above 60° C.

7. *Aging and Curing the Extract.*—Some investigators contend that the flavor of vanilla extract is due to the vanillin and vanilla resins, others think it due to the vanillin and secondary compounds as alcohols, aromatic aldehydes and esters and that the resins merely serve as fixatives. If this view is true the aging is merely physical and is best done in glass or porcelain lined steel tanks.

Others hold that the aging is a chemical reaction between the various alcohols, acids, aldehydes, etc., present and the oxygen of the air. Such a process can best be carried out in unpainted porous oaken barrels.

All are agreed, however, that aging is necessary and that it should be carried out for not less than one year.

8. *Color of the Extract.*—The color of the extract varies under different conditions. An increase in alcoholic content of the menstruum up to 65% gives an increase in color. Dry beans give a much deeper color than moist ones. Glycerin and alkali increase the color when added to the menstruum.

9. *Effect upon Metals.*—Vanilla extract exerts an extensive action upon metals, such as copper, zinc, nickel, monel metal, lead and aluminum. It has very little action upon tin and none on gold or silver.

10. *Requirements of the Baking Trade.*—DeGroote reports that true vanilla extract will not withstand the demands of the baking trade. At the temperature of the oven it bakes out too readily and some more concentrated product must be used. A preparation fulfilling the necessary requirements generally consists of oleoresin of vanilla, vanillin, coumarin, alcohol and glycerin. Its composition will depend upon the price at which it is to be sold.

EXPERIMENTAL PART.

Our experimental work involved the preparation of vanilla tinctures made according to the N. F. IV and prepared from Mexican beans, Bourbon beans and mixtures of these in various proportions. The resulting tinctures were allowed to age for a period of six months before the experiments were carried out. The experiments consisted of submitting various samples of the tinctures to various individuals who tried their flavoring strength and quality on such preparations as vanilla syrup for soda fountain purposes, flavoring for cake icings, puddings, candy, etc. The reports from the effects of the flavoring have indicated that the tincture prepared from pure Bourbon beans gives the most satisfactory and fragrant flavoring to preparations, which require heating. In preparations which were not subjected to heat the most fragrant and pleasant flavor was imparted by a tincture prepared from a mixture consisting of 40% of Mexican beans and 60% of Bourbon Vanilla Beans.

CONCLUSION.

The fundamental point of interest that we want to bring out in this paper is the fact that one type of vanilla tincture will not flavor all preparations with

its maximum strength and fragrance of flavor. In order to obtain the most desirable results it is advisable to use two types of tinctures. The tincture prepared from pure Bourbon vanilla beans is best suited for the flavoring of preparations subjected to heat, such as puddings, cakes, candy, etc. For the flavoring of preparations not subjected to heat treatment the most desired results are obtained by flavoring with a tincture prepared from a mixture of 40% of Mexican and 60% of Bourbon Vanilla Beans.

The compound tincture of vanilla, official in the N. F. III, containing coumarin and vanillin as basic flavoring agents and containing no extracts of vanilla beans is frequently employed as a substitute for the vanilla bean tincture. The quality of the flavor imparted by this type of preparation surely leaves much to be desired and does not compare with the quality of the flavor imparted by a tincture prepared from the vanilla beans.

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(58) "Vanilla and its Culture;" Dexraux, *Am. J. Pharm.*, 317 (1847).

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A PHARMACEUTICAL STUDY OF SYRUP OF FERROUS IODIDE (1840–1927).

BY CATY J. BRAFORD AND H. A. LANGENHAN.

(*Continued from p. 437.*)

No. III. PRESERVATION OF SYRUP OF FERROUS IODIDE.

To find a satisfactory procedure for the preservation of **Liquor Ferri Iodidi** has been a problem with which the pharmacist has been working for a long time. As early as 1839 Frederking[1] suggested the use of saccharine material. The following year Proctor[2] published a paper in which he outlined the experiments he had performed with sugar of milk, manna, cane sugar, honey and "uncrystallizable" sugar. In 1841 Dupasquier[3] used "syrup of gum" to make his preparation more stable. Beral[4] added simple syrup. This experimentation probably led to the introduction of the **Syrupus Ferri Iodidi** into the U. S. P. of 1860.

Although the Syrup was more stable than the Liquor had been, the pharmacists still found it difficult to keep this preparation unchanged. Maisch[5] was an early worker who presented a theory of the decomposition. He considered that a solution of ferrous iodide was decomposed not only by light but also by the action of the atmospheric oxygen in the bottles that were only partly filled and frequently opened. He thought that the oxidation of the iron and liberation of iodine were hastened by the action of light. He found that when an altered solution was transferred to air-tight bottles, completely filled and exposed to direct sunlight, it resumed its transparency and the original color was completely, or at least par-

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* A non-corroding alloy of nickel, copper, cobalt and iron.—EDITOR.

[1] Frederking, *Am. J. Pharm.*, 58, 289 (1886).

[2] Procter, Wm., *Ibid.*, 12, 13 (1840).

[3] Dupasquier, *Jour. de Pharm.* (1841); through *Am. J. Pharm.*, 58, 289 (1886).

[4] Beral, *Am. J. Pharm.*, 13, 74 (1841), from *Jour. de Chem. Med.*

[5] Maisch, *Ibid.*, 27, 218 (1855).

tially, restored. Maisch concluded that after such a restoration the solution must be in some way altered and suggested that it would then contain some iodate of the "sesquioxide of iron."

The U. S. P. of 1860 directed that the Syrup be stored in "two-ounce, well-stopped" vials. The 1870 revision was about the same. These directions were modified in the next Pharmacopœia to read, "Transfer the contents (finished syrup) to small vials, which should be completely filled, securely corked and kept in a place accessible to daylight." In 1890 the directions were briefer, reading "small well stoppered and completely filled bottles." The U. S. P. of 1900 offered no method of preservation whatever but, in 1910, it was again specified that the syrup be kept in "completely filled, tightly stoppered bottles." The last Pharmacopœia offers the same method.

The belief that storing in a small bottle aided in the preservation of the syrup, because of lesser exposure to air, was evidently a common one. The Editor of the *American Journal of Pharmacy* published a note in 1868 in which he stated that he believed a "properly-made official syrup enclosed in small bottles (dry), closing them effectively and keeping it exposed to light, is the best protective method." Tilden[1] suggested layering the syrup with oil as a means of excluding the air and in that way preventing oxidation and decolorization. About the same time Hughes[2] published a paper on the subject of preservation in which he concluded that "a thick well-made syrup covered with parchment, kept in a warm place, keeps best." He especially condemned the practice of storing the syrup in cold dark cellars, and objected to the use of corks, due to the tannin that they might contain. The same year Holloway[3] recommended exposing the syrup to direct sunlight for a few hours daily so as to prevent oxidation. He also, like Maisch, stated that this process would restore a discolored preparation. Some years later Beck[4] devised a process for preservation in which "carbonic acid gas" was used to exclude all air. His article included an illustration of the apparatus which he had used to generate the carbon dioxide. Sawyer[5] suggested bottling the syrup in small vials while it was still hot, the size of the container to be varied according to the needs of the pharmacist. These vials were then to be sealed with a mixture of paraffin and white wax.

The various suggested methods for properly storing the syrup did not seem to overcome the difficulties of preservation, so other processes were adopted. These processes may be grouped into three classes. The first of these includes the introduction of sugar and its substitutes to the Liquor. The second deals with the introduction of both organic and inorganic acids and the salts of some of these. Group three is a collection of the miscellaneous processes which were suggested at different times.

No. 1.—Several sugars were used in the manufacture of the syrup. The U. S. P. preparation called for syrup made from sucrose, or cane sugar. Hammer[6]

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[1] Tilden, *Pharm. Jour.*, 9, 260 (1867).
[2] Hughes, *Ibid.* (Nov. 1868); through *Am. J. Pharm.*, 41, 14 (1868).
[3] Holloway, *Ibid.*, 9, 471 (1867).
[4] Beck, *Am. J. Pharm.*, 64, 18 (1892).
[5] Sawyer, *Bull. Pharm.*, 23, 254 (1909).
[6] Hammer, *Pharmacist* (Apr. 1876); through "British Year Book of Pharm.," 287 (1876).

prepared a stable syrup in which he considered grape sugar to be the preservative. His theory was that "an aqueous solution of ferrous iodide is changed to free iodine and sesquioxide of iron, when it is partially acted upon by the oxygen of the air. Heat or direct sunlight will change the free iodine into hydriodic acid. Decomposition takes place if cane sugar is present in the diluted acid—the formation of grape sugar and the liberation of free iodine. The remaining portion of the uncombined cane sugar is at the same time exerting its action upon the precipitated oxide of iron, deoxidizing it and, thereby, increasing the percentage of grape sugar, the liberated iodine again combining with the deoxidized iron to form protoxide of iron. When this stage is reached it prevents further decomposition of the preparation and it may now be exposed to oxidizing influences, provided a certain percentage of grape sugar is present." Wayne[1] observed that grape sugar was sometimes deposited when a sample of the syrup was kept for some time and he considered such a change probably to be due to the conversion of cane sugar through the agency of the hydriodic acid present.

Cane sugar alone did not prove satisfactory and various experiments were made in which a portion of the saccharine substance was glucose. Interesting work along this line was presented by England,[2] who believed that if glucose would preserve Vallet's Mass it might prove efficient in the preservation of ferrous iodide. He first used the commercial glucose, and then a mixture of glucose and dextrin. These were too powerful in their actions; a large quantity would cause the precipitation of ferrous oxide and a small quantity allowed both oxidation and reduction. He next tried solid glucose and found it to be fairly satisfactory. He explained the decomposition of an unpreserved sample as first an oxidation to a ferric compound and then a precipitation of ferric hydrate and iodine. To the first reaction he gave the following equation: $2FeI_2 + O + H_2O \longrightarrow Fe_2I_2O_2 + 2HI$.

Glycerin[3] was suggested as a preservative for Syrup of Ferrous Iodide. Gregory[4] substituted it for the simple syrup. The investigations carried on by Wells[5] encountered the usual difficulties when the glycerin and syrup were mixed. To remedy this Wells used a glucose syrup. In 1900, Meredith[6] published a paper in which he discussed the question of whether or not glucose and glycerin really improve the keeping quality of the syrup. He concluded that glycerin is not objectionable medicinally; that it prevents oxidation and is thus a preservative; that it assimilates iodine after liberation, in a non-irritating form; and that it is not objectionable in this preparation. When it was to be used he recommended that it replace half of the sugar called for in the formula. Although he considered glycerin to be a good preservative, he thought that glucose was a better one, because it reduces iodine and forms hydriodic acid, and prevents oxidation. He found that a glucose solution having a specific gravity of 1.4 was the most efficient.

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[1] Wayne, "U. S. Disp.," ed., 13, 1433 (1875).

[2] England, *Am. J. Pharm.*, 60, 547 (1888).

[3] England, *Am. J. Pharm.*, 60, 547 (1888).

[4] Gregory, *New Rem.*, 110 (1878); through "British Year Book of Pharm.," 15, 329 (1878).

[5] Wells, "British Year Book of Pharm.," 21, 277 (1883); from *Pharm. J.*, 3rd series, 14, 82.

[6] Meredith, *Am. J. Pharm.*, 72, 468 (1900).

Other investigators[1,2] have worked with glucose and have obtained what they consider to be satisfactory results. A recent article[3] dealing with the "Relative Preservative Values of Glycerin and Sugar Solutions" offers the following conclusions in reference to Syrup of Ferrous Iodide:

1. Inversions and caramelization make sucrose solutions quite unsuited for preservatives.
2. Glycerin, on account of the opportunity of increasing the molarity, is more efficacious as a preservative.

Glucose was prescribed in the B. P. V formula, but according to Cowie[4] may not have been much of an improvement.

The above methods may have been successful but they were soon replaced by the second large group of preservatives, the acids and their salts.

No. 2.—As early as 1860, Ferdinand Mayer[5] published a paper on the Liquor Ferri Iodidi in which he recommended that Hyposulphite of Soda be used as a preservative, or as he called it, "a deoxidizing substance." His formula called for an excess of iodine to which the hyposulphite of soda was added in equivalent proportions, to form "hydriodic acid and tetrathionate of soda." He considered the salt to be inert but capable of insuring the permanency of the protoiodide.

Tschirner[6] suggested adding the sodium hyposulphite to the fresh syrup, rather than mixing it with the iodine and consequently decomposing it. The following year Judge[7] recommended that hypophosphorous acid be used in preference to sodium hyposulphite to restore Syrup of Ferrous Iodide. His theory was that sodium sulphate forms on the addition of sodium hyposulphite and that one-half of the sulphur precipitates, leaving the syrup as unpleasant in appearance as before the addition. Hypophosphorous acid having the same affinity for oxygen would effect the same change, leaving the syrup clear and of the proper color. Hausmann[8] conducted several experiments in view of preparing a more permanent syrup and his work showed that the addition of hypophosphorous acid was an aid in the preservation. Matuson[9] agreed with this and in his article published in 1903 he included a revised formula suggested by Robinson which called for the addition of twenty per cent acid. Hall[10] likewise added it.

The U. S. P. VIII and the U. S. P. IX directed that twenty cc. of diluted hypophosphorous be added to each one thousand cc. of Syrup of Ferrous Iodide. The last revision changed that slightly and prescribes five cc. of hypophosphorous acid, equivalent to fifteen cc. of the diluted acid, for each one thousand cc. of syrup.

Other acids and salts have been used and good results claimed. Groves[11] used

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[1] Lyon, *Pharm. J.*, 3rd series, 24, 863 (1894); through "British Year Book of Pharm.," 201 (1894).

[2] Pulsifer, *Pharm. Era*, 18, 489 (1897).

[3] Krantz, Jour. A. Ph. A., 12, 963 (1923).

[4] Cowie, *Pharm. J.*, 94, 236 (1914).

[5] Mayer, *Am. J. Pharm.*, 32, 175 (1860).

[6] Tschirner, *Am. J. Pharm.*, 47, 249 (1875).

[7] Judge, *Ibid.*, 48, 157 (1875).

[8] Hausmann, *Ibid.*, 72, 217 (1900).

[9] Matuson, *Ibid.*, 75, 71 (1903).

[10] Hall, *Bull. Pharm.*, 18, 374 (1904).

[11] Groves, *Pharm. J.*, 27, 421 (1868).

sulphuric and phosphoric acids. Rother[1] recommended the use of sodium sulphite, but specified that care be taken to add it after filtration as otherwise the sulphurous acid, which had been formed by the sodium sulphite reacting with the "iodohydric" acid, would be decomposed into free sulphur and water. Various other workers preferred tartaric acid.[2] The "French Codex" has prescribed its use also. Citric acid has been considered; experiments using it as a preservative have been carried on for a long time. As early as 1870 Beardsworth[3] found that bright light and citric acid would clarify a decolorized syrup and keep it clear. He recommended the addition of one grain of acid to each ounce of syrup. Parrish[4] also used it. A little later (1876) Dr. Pile[5] stated that he had been unsuccessful in preventing a change in Syrup of Ferrous Iodide by the addition of citric acid, unless the extra precaution were taken to keep the syrup in well-filled vials and excluded from contact with the air. The subject was discussed in foreign journals[6] and the addition of one and a half Gm. of acid to thirteen hundred Gm. of syrup was considered to be sufficient. In 1895, Girard[7] offered a new formula which he declared to be free from the objectionable features of the Pharmacopœial and the Codex formulas, *viz.:*

Iron	20 parts
Distilled water	100 parts

Proceed as directed under the Codex or Pharmacopœia and after the solution is obtained, mix it with the following syrup.

Citric acid	5 Gm.
Distilled water	100 Gm.
Alcoholic essence of orange peel	10 Gm.
Simple syrup q. s. (with the iron solution)	1 kilo

Cloughly[8] later suggested a new formula in which citric acid was one of the improvements. Various other workers[9,10,11,12,13] have from time to time suggested its use, varying the amount of acid from one-fourth to one per cent. Dr. Borisch[14] did considerable work on Syrup of Ferrous Iodide and he likewise suggested that it be preserved by the addition of citric acid (0.05%). Williams[15] reported that a more desirable syrup was furnished by the formula given in the Squibb's Labora-

[1] Rother, *Pharm. and Chem.*, 9, 193 (1876).
[2] Jeannel, *Bull. soc. pharm. Bordeaux*, through *Jour. Pharm.*, 41, 16 (1869).
[3] Beardsworth, "British Year Book of Pharm.," 7, 58 (1870).
[4] Parrish, *Am. J. Pharm.*, 48, 209 (1876).
[5] Pile, *Ibid.*, 48, 442 (1876).
[6] Carles, *Bull. Soc. Pharm. du Sud. Ouest*, through *Am. J. Pharm.*, 53, 359 (1881).
[7] Girard, *Pharm. Era*, 13, 334 (1895).
[8] Cloughly, "Proc. Mo. Pharm. Assoc.," 133, through A. PH. A. YEAR BOOK, 1, 65 (1912).
[9] Wiebelitz, *Pharm. Ztg. Berl.*, 51, 1004 (1906); through "Digest of Com." (1906).
[10] Lorenzen, *Apoth. Ztg.*, 23, 295 (1908); through "Digest of Com." (1908).
[11] Dunn, PROC. A. PH. A., 57, 950 (1909).
[12] Hommell, *Prac. Drug.*, 29, 29 (1911); through "Digest of Com." (1911).
[13] Caldwell, *Drug. Circ.* and *Chem. Gaz. N. Y.*, 49, 220 (1905); through "Digest of Com." (1905).
[14] Borisch, A. PH. A. YEAR BOOK, 2, 75 (1913); *Apoth. Ztg.*, 29, 902, through "Digest of Com." (1914).
[15] Williams, *Western Druggist*, 37, 6–7, through "Digest of Com." (1915).

tory notes in which citric acid was used. E. Fullerton Cook,[1] in an article discussing the Syrups and Elixirs of the U. S. P. IX and the N. F. IV, stated that citric acid was preferable to hypophosphorous acid. The next year another worker[2] suggested that it be used in the proportions of 0.05 to 0.1 grains to one hundred Gm. of syrup. Beringer[3] concluded from his observations that it has no reducing power on the sugar.

The pharmacopœias of Holland, Austria, Switzerland, Belgium and Hungary all prescribe the use of citric acid.

Potassium citrate[4,5] has been used during the last few years as a preservative and also as a means of obtaining a more palatable preparation.

Even hydriodic[6] and lactic[7] acids have been used. In each case the amount of acid was usually small, being between one-fourth and one per cent of the total volume.

No. 3.—The third group of preservatives includes the various other materials which have been suggested. Perhaps the most common of these is metallic iron, placed in the finished syrup. In this way any free hydrogen iodide was converted to ferrous iodide before it could decompose and liberate free iodine. According to England[7] this did not retard the ultimate decomposition as "it seems plain that it did not prevent the formation of the ferric oxysalt and hydriodic acid but merely preserved for a time the transparent color of the syrup."

Izard[8] added a few drops of alcohol as soon as the iodine had been combined with the iron. He worked on the theory that an aldehyde would be formed and would prevent the oxidation of the ferrous salt. Another worker[9] added one per cent of alcohol to the finished preparation.

Although preservatives evidently have been accepted as being essential, and have been adopted by the U. S. P. and other pharmacopœias, one still finds workers who consider them not only unnecessary but even objectionable. Some believe that a preservative is necessary only when the syrup is not properly and carefully prepared. Harries[10] expressed the opinion that if hypophosphorous acid prevented the decomposition of the syrup in the bottle it might do the same in the stomach, and in such a way alter the therapeutic value and efficiency. Alpers[11] carried out a series of experiments and concluded that a preservative is not essential. He states, "Syrup of Iodide of Iron made from the best ingredients does not need any preservative to remain perfect on the shelves of the shop. The samples with hypophosphorous acid kept equally as well as those without it, but its addition is neither an advantage or a necessity. After dispensing, or when bottles

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[1] Cook, Jour. A. Ph. A., 6, 75 (1917).

[2] Wilkening, *Süddeut. Apoth.-Ztg.*, 373 (1917), through *Pharm. Zentrahl.*, 59, 301, through "Digest of Com." (1918).

[3] Beringer, *Am. J. Pharm.*, 86, 358 (1914).

[4] *Süddeut. Apoth.-Ztg.*, 64, 182 (1925); through A. Ph. A. Year Book, 12, 76 (1925).

[5] Anon, *Am. Drug.*, 11, 13 (1923); through "British Year Book," 404 (1924).

[6] Meier, *Drug. Circ.*, through *Am. J. Pharm.*, 49, 134 (1877).

[7] England, *Am. J. Pharm.*, 60, 547 (1888).

[8] Izard, *L'Union Pharm.*, 102 (May 1883); through *Am. J. Pharm.*, 55, 402 (1883).

[9] Noblet, A. Ph. A. Year Book, 2, 76 (1913).

[10] Harries, *Pharm. J.*, London, 28, 366 (1909); through "Digest of Com." (1909).

[11] Alpers, Jour. A. Ph. A., 3, 420–423 (1914).

are opened several times a day, citric acid is the best preservative; but its power seems to be restricted to a limited time, after which discoloration takes place rapidly." Beringer[1] objected as did Cook,[2] because it caused the color of the finished syrup to be darker. Thum[3] believed that the use of preservatives in either food or drugs should not be encouraged.

UNIVERSITY OF WASHINGTON,
COLLEGE OF PHARMACY,
SEATTLE, WASH.

(To be continued)

COMBINED OPERATION FOR DETERMINATION OF WATER AND PHENOLS IN COMPOUND SOLUTION CRESOL, U. S. P.

BY HUBERT H. OHAYER.

The directions for assaying Compound Solution Cresol given in the U. S. P. specify that 50 cc. of the solution, 150 cc. of kerosene, purified by shaking out with NaOH solution, and 3 Gm. $NaHCO_3$ be placed in a 500-cc. distilling flask and distilled to decomposition of the residue. In a laboratory where it is necessary to have a check on both the phenol and water content of the finished solution, the water assay can be quickly and easily combined with that of the phenols in the following simple manner.

The water and the kerosene-phenol solution are distilled from the flask at A through the condenser B and into the little trap C where the water remains and the lighter than water mixture flows over through the outlet tube into the separatory funnel D directed by the U. S. P. as the receiver for the phenol assay distillate. The trap is graduated in tenths of a cc. and has a capacity of 10 cc. It can be purchased easily and may or may not be fitted with a stop-cock at the bottom. The amount of water is read off, multiplied by two gives the percentage of water originally present in the Compound Solution. The contents of the trap may then be rinsed into the separatory funnel and the phenol assay proceeded with as directed in the U. S. P.

The author has purified kerosene by shaking it out with NaOH solution as directed and has then distilled it through this apparatus and found that not enough water is dissolved by the kerosene to affect the accuracy of the method.

PARKE, DAVIS & CO.,
DETROIT, MICH.

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[1] Beringer, *Am. J. Pharm.*, 86, 358 (1914).

[2] Cook, PROC. A. PH. A., 56, 958 (1908).

[3] Thum, BULL. A. PH. A., 5, 646 (1910); *Am. Drug.*, 57, 130; PROC. A. PH. A., 58, 1265 (1910).

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

WHAT IS REALLY AT THE BOTTOM OF ALL THIS TALK ABOUT PRICE MAINTENANCE?

From Washington come year after year the reports of anxious independent merchants and their lobbyists desperately trying to persuade busy Congressmen to consider their plight. Huge department stores, chain stores and mail order houses are underselling the independent merchants, they say, and soon the individual merchant will be as much off the commercial map as tandem bicycles and paper collars. The only hope, they say, is for an all-wise Congress to pass a law which prohibits the huge chain and department stores from selling standard merchandise at ruinously low prices.

To the independent merchant, the price-cutting tactics of these large distributors are exactly analagous to the ruinous rate wars of railroads and steamship companies which were so common in the 80's and 90's. An Interstate Commerce Commission, created by an act of the same all-wise Congress now being appealed to, as well as numerous local regulatory bodies, have long since banned rate wars between transportation companies as something economically and socially unsound.

Isn't it only fair and just then, says the independent merchant, that he should be freed by law in the same way from these seemingly predatory practices of his rich and sometimes unconscionable competitors? With such a law, competition between merchants, he says, would be reduced to the same harmonious and tranquil basis that exists to-day between established transportation companies. That's a brief outline in the abstract of the independent merchant's desire to be protected from the price-cutting tactics of his strongly intrenched and enormously large and wealthy competitors.

To put the idea specifically, let's turn a minute to the situation as it is faced by one Mr. John Jones, able and aggressive neighborhood druggist in Seattle.

John Jones, because of superior ability and able management, runs his drug store at less expense than his competitor two blocks away. He proposes to capitalize this superior ability and able management by passing on to his customers in the form of lower prices these savings he makes in operating expenses.

John Jones objects, most strenuously, to any attempts to control the prices at which he sells his merchandise.

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He says, in effect, if my competitors by their continued use of out-of-date and inefficient methods are compelled to charge high prices in order to make a profit, why should my customers and I be penalized or restricted because I am more progressive and up-to-date?

However, the differences in the operating expenses of the most efficient and the least efficient merchants are not very much. Even if the highly efficient merchants passed on to their customers every cent of their savings, in only a few instances would the reduction amount to as much as 10 per cent. Any merchant knows that a 10 per cent reduction is not a potent drawing card, nor is it a disorganizing competitive influence. On the other hand, any merchant knows that a 10 per cent reduction in operating expenses easily may double net profits. Hence he is interested in operating efficiency almost entirely because of its profit possibilities rather than as a weapon in a competitive price war.

John Jones does not view the problems of price-cutting so complacently when another druggist opens a store a block away. Among other things, this new competitor features a well-known face cream at the astonishingly low price of 29 cents.

"How can that be?" Jones asks excitedly, "That is less than the wholesale price. And I know that the makers of that face cream are not the kind of a firm to give secret discounts."

Jones sends a shopper to visit the new store. Yes, the face cream is being sold freely at the 29-cent price.

"Here is something else I bought," says the shopper. "A package of bath salts."

"How much was that—twenty cents?"

"No, one dollar."

"One dollar—why, we sell that very same thing for fifty cents and have sold it for years for fifty cents. They only cost thirty cents."

No merchant can sell merchandise at or below cost and continue long in business. If his income is not quite sufficient to cover the cost of the merchandise he sells, he has, naturally, no money with which to pay his operating expenses, and of course, no profit. The only way that a merchant who sells merchandise at or below cost can obtain the money with which to continue in business is from the extra margins and profits of other merchandise which he sells at a price sufficient to repay him his losses on the merchandise sold at or below cost.

In the case just cited, the extra high margin on bath salts (as well as on many other items) helps to repay the losses from the sale below cost of the well-known face cream.

Why should a merchant resort to these complicated manœuvers in order to earn the profits which are necessary for his continuance in business? Anyone familiar with merchandising knows that most people judge value by price. When an article usually sold for fifty cents is suddenly offered for twenty-nine cents the impression of a bargain is instantaneous, because, through long familiarity, fifty cents is the value people place upon this article. For many thousands of articles, however, there are no customary or usual prices and, therefore, no standards of value in people's minds.

The merchant who wants to create the impression then that his prices are phenomenally low has merely to choose well-known articles with fixed or customary

prices and offer these at slashing reductions. Many of his customers falsely assume that all the articles in this store are being sold at similarly reduced prices, although, as a matter of fact, these articles really have to be sold at unconscionably high prices in order to repay the merchant his losses from the sale of the well-known articles at or below cost.

The intelligent storekeeper has no legitimate quarrel with the merchant who through skill and ability is able to conduct his business at a low expense and passes part or all of this saving to his customers in the form of reduced prices. However, the intelligent merchant does feel that he has a just complaint against the merchant who uses greatly reduced prices on well-known articles to create the false impression that all through his store similar bargains exist. Why should the purchaser of the bath salts, for instance, pay the selling costs and profit incident to the sale below cost of a well-known face cream?

The retailer performs a necessary and useful service in placing this well-known face cream within easy access of his customers. This retail service is a service for which the purchaser of face cream expects to pay and should pay.

Is it honest and fair, says the merchant, to take advantage of the ignorance and lack of information of the purchaser of bath salts and compel him to pay the costs of selling and the profits normally incident to the sale of face cream in addition to the selling costs and profits which should accrue from the sale of the bath salts?

Such practices seem reminiscent of the days of haggling and barter in retailing. Then a retailer made his price what he thought his customers could or would pay. Many times, one customer, because of superior bargaining ability, paid $15.00 for an overcoat which was an exact duplicate of the one for which his neighbor paid $30.00.

The man who paid $30.00 paid the selling costs and profits incident to the sale of both coats. Such practices fortunately have been practically ostracized from trade. But fifty or more years ago, when John Wanamaker announced a one-price policy in his retail business, he was regarded as a heretic and a fool, although to-day the one-price policy is well-nigh universal in the United States and many other countries.

Certainly it should be no more difficult to make a person recognize the unfairness and downright misrepresentation of a policy which requires the purchase of goods of unknown value to pay the losses resulting from the sale of known value at or below cost.

The wise manufacturer should be just as much interested in an honest-profit policy as the harrassed retailer menaced by cutthroat competitors. When a product is used as a football in a cut-price war, the retailer who sells it at or below cost has no more interest in that merchandise than a fisherman has in the bait he uses. When this merchandise ceases to attract customers, out it goes, with no more ceremony than an empty carton. On the other hand, the retailer who tries to pursue an honest profit policy in the face of this competition is compelled to concentrate his efforts on merchandise which is not sold by his cut-price competitors at or below cost. Consequently the sales of the cut-rate merchandise sooner or later must suffer from both of these causes.

Furthermore, anyone familiar with retailing knows the tremendous influence that window display, store display and retail salesmanship have upon the sales

of a particular article. No intelligent retailer will try to increase the sale of an article at a price which compares unfavorably with the price at which the same article is offered in other stores. Nor will he try to increase the sales of an article which must be sold at or below cost.

So you see the independent merchant who complains so loudly of the cut-throat tactics of some of his large-size competitors has no little public interest on his side not to mention the very obvious economic interests of the manufacturers and wholesalers who supply the independent merchants with the goods they sell.

LEGAL REMEDIES AREN'T MEANT TO CURE ECONOMIC CONDITIONS.

Every once in a while merchants faced with new or unexpected competition are apt to look for and even demand legal protection from such encroachments upon what they regard as a field belonging exclusively to them. A very few years ago merchants in various cities were very much up in arms at the inroads house-to house-hosiery salesmen were making upon their sales in these lines. Straightaway the merchants decried these vendors, calling attention to the fact that these new competitors had no expensive buildings to maintain, paid no local taxes and offered no service or credit. It is unfair, the merchants claimed, to let these outsiders come in, therefore, and take away business from long-established local houses. Several cities passed ordinances which were aimed to tax these house-to-house canvassers out of existence. Fortunately for the economic peace of the country, however, many such ordinances have been held unconstitutional by the highest courts.

Some years have passed since house-to-house selling first became an important factor in retail trade. In this time house-to-house selling has probably maintained and perhaps increased its volume. Yet these past few years have been among the most profitable ever enjoyed by retail stores. The dire predictions about the inroads which canvassers would make upon retail stores seem to have been without warrant. What is the explanation?

Shrewd merchants, when their hosiery departments, for instance, began to lose business to the canvasser, instead of looking for legal relief, looked to their own hosiery departments. Why should people buy from canvassers instead of the local merchant, they said. In finding the answer to this question they discovered a number of weaknesses in their selling organization which, when corrected, now made their hosiery departments even more attractive than the canvasser method of buying.

In other words, the merchants discovered that the reason for the success of the canvasser was that he, in his line, was proving a better merchant than they were in these lines. By improving their own methods to or above those of the canvasser they had no difficulty in competing with him.

What has been done with hosiery has been done with brushes and a dozen other lines of merchandise. It requires no particular imagination to see that in the future still other lines of merchandise will be sold by canvassers and even by other selling methods as yet undeveloped. Perhaps some of these sales will be of merchandise now sold most commonly in drug stores.

The druggist who would succeed in the face of this competition yet to come has merely to analyze his position with respect to it, building up the places at which he is weak and making even stronger the natural advantages he possesses.

In saying that merchants should not seek legal relief for economic ills I do not mean to imply, of course, that there are not times, especially in connection with pharmacy, when legal restrictions and control are absolutely necessary. No one denies, for instance, the desirability of restricting to drug stores the sale of poisons. Whenever the public welfare is jeopardized legal means are the most desirable way to assure relief and protection. Legal means should not be used, however, to attempt to control ordinary economic conditions.

SEASONABLE DISPLAYS FOR JUNE AND JULY.

Graduation and wedding gifts	Bath requisites
Perfumes and toilet articles	Bathing caps and supplies
Stationery	Vacation needs
Fountain pens and pencils	First aid kits
Cameras and photographic supplies	Sunburn, ivy and insect poison lotions
Film developing, printing and enlarging	Soda fountain
Nursery supplies	Ice cream and bottled soft drinks

THE SUPPLY OF MEDICINAL PLANTS IN CENTRAL EUROPE.

In spite of the immense development of the medicochemical industry, a large number of plants is still used in pharmacology. The demand for these plants has, in fact, increased in recent years because manufacturers find it easier to derive certain active substances from plants than to produce them synthetically. To mention only a few—digitalis, opium, the mallow and aloes, are used preferably in natura. As a result, in large sections of Central Europe, and also in France, Italy and Russia, the planting of medicinal herbs has been greatly increased. Through the attention given to the subject by the various governments and by pharmacologic interests, the "Mitteleuropäische Tagung für Arzneimittelversorgung" was recently organized in Vienna, and, during the two-day session, the various problems pertaining to the collection and the marketing of medicinal herbs were thoroughly gone over. It was decided to make the work international in scope, and a central bureau will be established in Vienna, which will collect and furnish information in regard to all European stocks of medicaments of both vegetable and nonvegetable origin. The organization will inure to the benefit of both producers and dealers. In experiment stations to be erected, the best methods of growing the several varieties of medicinal plants will be carefully studied. The cultivation of medicinal plants (and also of tobacco) permits the profitable use of soil that is not suitable for grain and cattle raising. The Institute for Pharmacognosy of the University of Vienna has assumed the task of organizing the international committee; it will also work out plans for government support. —From U. S. Consular Report.

LIMITATION OF PHARMACISTS IN TURKEY.

The proposed pharmacy law of Turkey will necessitate the closing of about three hundred businesses and is seriously disturbing the pharmacists of that country; most of them are opposing the provision which limits the number of stores.

LIBRARY AND MUSEUM ITEMS.

Mr. Hays of the motion picture industry has outlined a plan for keeping originals of historical films. He asserts that science has made it possible to preserve such negatives indefinitely if properly stored. Starting with the second inauguration of President McKinley about 1000 reels of films of great historic value are now available.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

Wilford Harrison, President, Wichita Falls, Texas. J. W. Gayle, Treasurer, Frankfort, Ky. W. P. Porterfield, Chairman of Executive Committee, Fargo, N. D. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
Indiana	Montana		

N. A. B. P. EXECUTIVE COMMITTEE MEETING.

The N. A. B. P. Executive Committee held its annual meeting in the Chicago offices of the Association, Monday and Tuesday, May 2nd and 3rd, with the following present:

W. P. Porterfield, *Chairman;* M. N. Ford; Lucius L. Walton; Wilford Harrison, *President, ex-officio;* H. C. Christensen, *Secretary, ex-officio;* J. W. Gayle, *Treasurer.*—Chairman Porterfield presided.

The Monday morning session was spent in inspecting the office, which now consists of a suite of three rooms—a reception and outer office, a second and larger room used as the Secretary's private office, and a smaller room which is used entirely as a workroom.

The private office also contains the library, vault, safe, files containing State laws, college and Board information, and a number of other files with information of various kinds for quick reference. On the walls of this room are twenty-three 12 x 15 framed photographs of ex-presidents of the Association, also larger portraits of noted pharmaceutical educators who have passed into the beyond—Procter, Hallberg, Oldberg, Remington and others. Framed convention and other group pictures are distributed throughout the offices.

In the workshop, where the Association's mimeograph work is done, are also the files containing the records of reciprocal registrations, also files of several hundred sets of examination questions prepared for distribution as samples as well as sets of Board questions received for filing from time to time.

Members of the Executive Committee expressed themselves as well pleased with the appearance of things and commented on the historical value to pharmacy of the records and material which is being accumulated in this office.

The afternoon session was spent in checking over the books and generally going over the affairs of the Association for the months that had elapsed since the Philadelphia convention.

Approval was given to the action of the Secretary and Mr. Walton, member

of the Executive Committee, in approving the application of New Jersey for membership in the Association as an active member Board.

Possibilities of enrolling as members the remaining three States—California, New York, Rhode Island—and the territory of Alaska were discussed, and the Secretary was authorized to take such steps in this direction as time and occasion may justify.

The matter of a budget for the fiscal year beginning July 1, 1927, was taken up, and after giving consideration to the estimated expenses and obligations of the Association for the coming year, amounts totaling approximately the same as last year were voted and approved.

Tuesday morning, the matter of whether or not it would be advisable to continue the N. A. B. P. Department in the JOURNAL A. PH. A. was discussed. Letters received from Editor Eberle, Mr. Winne, Mr. Culley, Mr. Hulett and others were read—all of which conveyed the thought of general approval of the Department and appreciation of the same by Board members generally.

On checking up the official list of Board members, it was discovered that a considerable number of members of Boards of Pharmacy are not members of the A. PH. A. and therefore do not receive the JOURNAL, and do not, therefore, benefit by the material published in the N. A. B. P. Department. It was regretted that every member of every Board of Pharmacy is not receiving the JOURNAL and the hope was expressed that individual boards would see to it that all of their members affiliate with the A. PH. A. so as to receive the JOURNAL monthly.

The Executive Committee members also expressed the thought that Board members should send to the Secretary for publication in the Department short articles of from 300 to 500 words on any topic or topics of their own choice which would be of general interest to Boards of Pharmacy.

It was hoped that as time goes on Board secretaries will form the habit of sending in regularly the many news items which *are* of general interest to Board members but which possibly have not heretofore been considered so by Boards.

Taken all in all, the Department as conducted in the past year was considered a success, and it was predicted that it would be much more so in the coming year. The Committee expressed itself as very much pleased with the assistance and coöperation given by A. PH. A. officials—Editor E. G. Eberle in the matter of conducting the **Department in the Journal** and Secretary Kelly in ASSOCIATION matters generally. An appropriation was included in the budget for continuing the **Department.**

The Tuesday afternoon session was spent largely in discussing and outlining the program for the coming 1927 convention at St. Louis. It was recommended that the Secretary's office prepare a tentative program to be published in the July N. A. B. P. **Department of the Journal.**

Just before adjournment, everybody present commented on the progress that has been made by the Association in the last few years and the increasing scope of its activities, which manifests itself in the added work of the Committee.

At 5:00 o'clock the Committee adjourned, subject to call by the Chairman.

CONVENTION DATES.

The 1927 Conventions of the A. PH. A., the N. A. B. P. and the A. A. C. P. will be held

at St. Louis, Missouri, during the week of August 22nd. Hotel Coronado will be the convention headquarters.

The N. A. B. P. twenty-fourth annual convention will meet on Monday and Tuesday, the 22nd and 23rd. The convention of the American Association of Colleges of Pharmacy will be held on the same dates. The convention of the A. PH. A. will continue throughout the remainder of the week.

Tentative program will be announced in the July issue of the JOURNAL OF THE A. PH. A. as will also information regarding hotel rates, railroad transportation, etc.

Reservations at the Hotel Coronado should be made early.

STATE BOARD OF PHARMACY NEWS ITEMS.

Alabama.—The Committee of Five, provided for by the Alabama Pharmacy Law to pass on colleges to be recognized, has defined a Class "A" college as an institution holding membership in the American Association of Colleges of Pharmacy.

The Secretary is continuing his tour of inspection of drug stores of the State, as to conformity with the requirements of the law.

Colorado.—At the April examination conducted in Grand Junction, six candidates out of fifteen were successful in passing the registered pharmacist examination. Four out of six taking the assistant examination were also successful.

On May 13th and 14th, another examination meeting was held at Science Hall, University of Denver, at Denver. Results are not available at the time this goes to press.

District of Columbia.—Ten out of fifty-seven candidates taking the April examination passed successfully and have received licenses. The prerequisite will not be in force until next year.

The following reciprocal applicants were granted certificates: Robert Hale Brice of South Carolina; Hugh Henry Norton of Mississippi; Edgar B. Allen of Virginia; George Allen Miller of Michigan; Carl L. Bradley of Arkansas; Britain J. Williams, Jr., Harry Hirsch and Eugene D. Millaway, all of Georgia; Paul F. Hauser of Pennsylvania.

Illinois.—The total number of candidates appearing for examination for registration as pharmacists at the March examination was 145.

Out of this number, 100 took the complete examination—written work, dispensing and oral—of whom 45 made the required general average of 75% or more, with not less than 60% in any one subject, and 55 failed.

The number of candidates retaking examination in one or more subjects, or in dispensing and oral, was 45—out of which number 27 made the required passing grades and 18 failed.

This means, then, that out of the total number of 145 candidates taking the complete examination or retaking one or more subjects, 72 were successful of whom 55 were graduates in pharmacy and 17 were candidates exempt from graduation under the law. The remaining 73 failed.

Reciprocal registrations were granted as follows:—Alf. R. Ahlstrom, Hodge L. Paden and William A. Small of Kansas; Frank E. Bocken, Rudolph Howard and Harry G. Rosenthal of Iowa; Andrew E. Godfrey, W. D. Heintz and Alexander A. Steffen of Wisconsin; Edward L. Gordon of Pennsylvania; Francis L. Hanika and Rollin C. Sherman of Nebraska, Jacob Isaacs and Robert J. Sieberz of Kentucky; Leopold F. Lang of Missouri; Saul Michelson of Massachusetts; Michael Niccoli of Colorado; and John Owens of Ohio.

Kentucky.—Eight out of twenty-eight candidates taking the April examination for registration as pharmacist at Paducah were successful in passing. Six of those passing were college graduates; six of the twenty failures were also college graduates.

Reciprocal registration was granted to Wilson M. Crowder of Tennessee; Walter C. Elbert of Ohio; and Benjamin Koby of Indiana.

The next meeting of the Board will be held in Louisville on July 12th.

J. W. Gayle, Treasurer of the N. A. B. P. and Secretary of the Kentucky Board, was recently elected a life member of the AMERICAN PHARMACEUTICAL ASSOCIATION, having been a member of the latter body for thirty-seven consecutive years.

Maryland.—William C. Powell, of Snow Hill, a member of the Maryland Board since 1902, has been reappointed by Governor Ritchie for another five-year term.

Mr. Powell is a graduate of the Maryland College of Pharmacy, 1895. He owns one of the oldest pharmacies in the State, the P. D. Cottingham Co., founded almost a century ago by the Powell family. The Powell Chemical Co., which manufactures pharmaceutical preparations and physicians' specialties, is also under his management.

Missouri.—Thirty-four out of sixty-three in the registered pharmacist class taking examination on April 11th and 12th at Kansas City passed successfully. Fifty-five out of eighty-six taking the assistant examination were also successful.

New Jersey.—An examination was held at Trenton on April 21st and 22nd, the practical work being given at Newark on April 28th. One hundred and seventeen took the registered pharmacist examination and 43 the assistant examination.

Daniel H. Hills, President of the Board, completed ten years of service on the Board, May 31, 1927. Dean B. Crawford of Atlantic City has been appointed to succeed him.

New Mexico.—A large class of candidates appeared for examination on May 23rd and 24th in the Indian Room of the Franciscan Hotel at Albuquerque. Several reciprocal applicants also appeared for interviews. Results and further details will be published as soon as available.

North Carolina.—An examination meeting was held on Tuesday, June 14th, at Chapel Hill. Results will be announced in the next issue.

Ohio.—Fifty-nine candidates out of a total of eighty-four were successful in passing the examination for registration as pharmacist given on April 5th and 6th. Nineteen out of twenty-three taking the assistant examination also passed.

Reciprocal registration was granted to Isadore L. Zeman of Pennsylvania and Kenneth A. Street of Indiana.

The next examination will be held in Columbus, June 21st.

Pennsylvania.—A drug store ownership bill was signed by the Governor on May 13th. This legislation was not obtained without a hard struggle on the part of Pennsylvania pharmacists. The original draft of the bill was amended by the Senate to exempt the ownership of stores wherein the sale of drugs is limited to proprietary medicines and commonly used household drugs.

At the April 1927 examination given by the Board, there were 185 applicants for the registered pharmacist certificate and 185 for the assistant grade certificate.

Tennessee.—The constitutionality of the Tennessee Pharmacy Law is being argued before the Supreme Court. A decision is expected within a month.

Samuel C. Davis, President of the N. A. R. D., and also the Tennessee Board, attended sessions of the United States Chamber of Commerce at Washington, May 3rd–5th.

The next meeting of the Board will be held at Hotel Peabody, Memphis, July 18th–19th.

Governor Austin Peay has not as yet appointed a member to succeed Dan Chambliss of Knoxville on the Pharmacy Board but it is rumored that Gay Clark of Morristown will be the man.

Texas.—Two hundred applicants were expected to appear for examination at the meeting held at the Galvez Hotel, Galveston, on May 24th, 25th and 26th. A class from Baylor University College of Pharmacy at Dallas and another from Texas University College of Pharmacy at Galveston were among the candidates for examination. The written work was given in the ballroom of the Galvez and the practical work in the pharmacy laboratories of the University of Texas.

Virginia.—The annual meeting of the Virginia Board was held on April 25th. The following officers were elected for the year: *President*, W. L. Lyle, Bedford; *Vice-President*, H. C. Littlejohn, Leesburg; *Secretary-Treasurer*, A. L. I. Winne, Richmond.

No examinations were conducted at the annual meeting but reciprocal registration was granted to the following:—Ralph L. Goode and George W. Robinson of W. Va.; Chas. H. Bradford of S. C.; John M. Carroll and Herbert W. Poole of D. C.; William P. McCraw of N. C.; James P. Frew of Pa.

A joint conference of members of the pharmacy faculty of the Medical College of Virginia and Board members was held at the same meeting to discuss matters of curriculum and board examinations.

An examination meeting of the Board was held in Richmond on June 7th and 8th. Results will be announced in the next issue.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

THE TEACHING OF BOTANY IN PHARMACY COLLEGES IN RELATION TO PHARMACOGNOSY.*

BY WILBER J. TEETERS.[1]

The most successful teaching of any science is to have a definite objective. In other words, definitely land the student somewhere and, if possible, create an interest and love for the subject.

The question has been raised as to whether the beginning course in botany as taught in our colleges really and truly prepares the student for the study of pharmacognosy which applies botany in a specialized way. In our colleges of pharmacy, connected with Universities, the pharmacy student is, as a rule, given the General Botany taken by Liberal Arts students, which is the general fundamental beginners' course.

Pharmacy students are not enthusiastic about this course, and the teacher of Pharmacognosy usually finds that he must give instruction in many things that should have been mastered in botany.

There must be a reason for this dislike of a most fascinating subject and also lack of knowledge of the specific information he should have gained as far as botany is concerned for the successful study of pharmacognosy.

The real object of this discussion is to find out the reason for this dislike, if it exists, and if the information in botany does not link up with pharmacognosy, and if possible suggest a remedy.

We do not think that this statement will be challenged—that our professional students in all subjects are interested in proportion to the use or application he can make of the information in his particular field. Our professional students are commercialized, at least to the extent that they want to see the connection between what they are getting and the use they are to make of it in practice. To put it plainly the students are asking the question, How is this information going to bring them dollars in their practice? As a rule, they are not interested in science for pure science's sake. This statement does not apply to botany alone but to other fundamental subjects as well. In elementary chemistry for instance, as taught to professional students, the teacher who spends too much time on technical theory and does not back up his points with illustrations that have an application to the profession the student is preparing for, will probably not hold the interest of his students and they will fail to get out of it what they should and, probably, as a result, dislike the subject. The chemistry must have an application to their particular field to make the right impression. If this is true of chemistry, a subject they know is the foundation of pharmacy, how much

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* Presented before the Section on Materia Medica of the American Association of Colleges of Pharmacy, Sept. 13, 1926.

[1] Dean, University of Iowa College of Pharmacy.

more is it likely to be true of botany, a subject that they consider, in a way, only a side issue.

The trouble with the teaching of botany is that students think they are not getting information they can use. They learn about protoplasm, cells, plant hairs and breathing pores, but are deficient in information about roots, leaves and flowers as applied to medicinal plants. We do not mean at all that the botany teacher, in order to make his course attractive, should instruct in medicinal plant constituents, history, dosage or use, but that he make his course attractive and interesting by emphasizing the points of botany that must be used in the study of pharmacognosy and that, in so far as possible, the teacher use medicinal plants to illustrate his points. This, coupled with field excursions or the use of drug gardens, should make botany more interesting, popular and instructive.

The solution of the successful teaching of botany is not for the teacher to emphasize the things he is particularly interested in himself which may be slime moulds and not of much practical value to a student of pharmacy, but to use medicinal plants for all illustrations. Make practical use of medicinal drug gardens and field excursions to connect the work with living things.

The next point is important. The teacher of botany should know and appreciate the application of botany to the specialized subject of pharmacognosy just as the successful teacher of chemistry applies even beginning chemistry to medicine, dentistry, engineering or pharmacy.

If this is done the teacher of pharmacognosy can devote his time to drug history, constituents and uses and the student will feel that the whole thing is practical, interesting and fascinating, and that no subject in the curriculum is of more direct value to him in the practice of his profession.

HIGHER STANDARDS JUSTIFIED.*

BY FREDERICK J. WULLING.[1]

In April 1926, the Board of Regents of the University of Minnesota definitely placed pharmacy at Minnesota upon a minimum four-year degree basis. This is one of the goals I have been working for during the past thirty-four years. It was part of a definite program which includes many more forward steps for the future and which I have already disclosed in a measure. The advancement of the minimum or lowest course in pharmacy to four years, thus placing pharmacy in Minnesota upon an unquestioned collegiate basis, was a long fight, with myself here in Minnesota the initiator and the only supporter until about a dozen years ago when the faculty approved and seven years ago when the Minnesota State Pharmaceutical Association, almost unanimously, endorsed the step and requested the University Regents to enact it. As far as I know, no pharmacist elsewhere advocated or worked for the same end,[2] but a number of educators long ago approved and hoped we in Minnesota would succeed and thus make it easier for their respective colleges to reach similar standards. There were many, however, who

* Read before Section on Education and Legislation, A. PH. A., Philadelphia meeting, 1927.

[1] University of Minnesota.

[2] The College of Pharmacy of the University of Ohio, which went on a minimum four-year basis in the fall of 1925, did so at the suggestion of the President of the University, I understand.

actively opposed the step, as they opposed the advance from the two-year to the three-year obligatory course, and in their opposition they thought it necessary to criticize me personally. That their criticism was not justified is proved by the fact that now all of the recognized colleges are or soon will be on the three-year minimum basis. I have heretofore taken very little notice of this personal criticism, taking it as part of the give-and-take of life, but some recent criticism is of such a nature that I thought I should write this article, not in defense, but in explanation and for the information it contains in the hope that my critical friends will discover at least a sincerity of purpose based upon a conviction that such work as I have been doing has been necessary and constructive as evidenced by periodical approval or enactment by individuals, institutions and associations, of the steps and principles advocated.

For over forty years now I have advocated and, in every case where I had the power to do so consistently, forced higher pharmaceutical standards. Forty years ago medicine and pharmacy were on a par as far as entrance requirements to colleges of medicine and pharmacy were concerned. In other words: there were no entrance requirements at all in the light of the requirements of to-day. Despite that fact there were many competent practitioners in both fields of service. In those earlier days many of the more capable ones had gotten their training in European countries where educational standards were higher. In those days the apprenticeship system, though on the wane, still turned out better pharmacists than some of the colleges did because much of the preceptor-training, especially in practical lines, was still very good and thorough. The chief difference between preceptor-training and college-teaching in the matter of the quality of student output, lay in the fact that *the preceptors carefully selected their apprentices* while the colleges discriminated not at all and accepted all who could pay the tuition fees irrespective of the preparation, quality or adaptability to the profession of the applicants. This was true also of medicine in a large measure, but the courses in medicine were longer and more difficult and those who completed them were on the whole more adequately trained scholastically and technically than were those who completed courses in pharmacy. Both colleges of medicine and pharmacy began raising their entrance and graduation requirements, but the colleges of pharmacy instead of keeping step with the colleges of medicine, allowed the latter to outstrip them greatly. Thus pharmaceutical educational requirements went relatively backwards (but from this shortcoming, pharmacy is now gradually recovering).

This was the situation after I had gotten well into the study of medicine and pharmacy in my youth. Long before that I had dedicated myself to the service of my fellows and now I decided this service should be in the field of pharmacy rather than in medicine, because pharmacy as the major medical specialty needed, more than medicine did, such ideals as I had set for myself and such work as I thought I could do. It seemed to me then that pharmacy needed a no less developed type of mind than other professions already possessed, because in the aspects alone of responsibility to the patient and of the possibility of disastrous results to life of incompetence, pharmacy seemed only second, among all professions, to medicine. It was my conviction also that if pharmacy had recruited its ranks with men of the same degrees of self-esteem, professional pride and

aggressiveness that characterized physicians as a group, it would have ranked more equally with medicine. *The fundamental difference between pharmacy and other professions lay not so much in the responsibility and scope or nature of practice, as in the mental and scholastic calibre of the practitioners.* The remedy seemed therefore simple enough for pharmacy: the raising of the educational and social standards to a point of adequacy. This I decided early in life to help to do. I realized I could not help as much at the prescription desk as I could in the educational field and so I chose the latter as the arena of my work and planned a program on which I have been working now for thirty-five years, unperturbed by criticism, greatly encouraged by the good-will of a few similarly-minded and happy in the knowledge of a modest achievement in the field of my endeavor.

It is needless to refer to more than one of many recent criticisms and I speak of this one only because it is of general interest:

"Higher standards increase the cost of education and hence decrease the number of entrants and correspondingly increase the cost of medicines to the sick." It is not true that higher standards decrease the number of applicants for admission. Experience has proven that the contrary is the case. It is true that higher standards increase cost of education and therefore of medicines. Higher standards in all walks of life entail higher cost, but the world has decided that standards and not cost shall come first. The world is developing by advancing standards. The production of the wherewithal to meet the higher cost is inherent in and concomitant with the development. The standards we are always concerned with are minimum standards. The differences in the minds of men relate to what the minimum shall be from time to time. The minimum standards of one profession or of one industry or of one government have definite relations to all other professions, industries, governments, as the case may be, and are determined largely by these relations. What the standards are or ought to be depends also in a large measure upon the minds which interpret the relations and their importance. If the high and increasing standards of other professions are justified, as I believe they are, pharmacy because of its scope and of the responsibility involved in its practice, is entitled to and requires equal standards. To demand or to be satisfied with low standards is to acknowledge inferiority. In the future pharmacy will refuse more vigorously than in the past to do this and will assert itself more aggressively. It will do so through higher and more discriminating minds which higher standards will attract to the calling and a calling which is distinctly a profession, as brought out recently in Dr. Charters' report of the Commonwealth Study of Pharmacy from the Functional Standpoint.[1] This report will aid greatly in bringing a much higher level of applicants into pharmacy. The more rapid rehabilitation and development of pharmacy will depend upon the right kind of recruits admitted upon the basis of adequate educational standards.

Although my mind has always been open and has often been changed by helpful suggestions or criticisms or by the opinions or judgments of others, it is unchanged in the matter of my early convictions and decisions relating to pharmaceutical standards.

[1] See also Mr. Johnson's presidential address, 1926 Meeting of the Minnesota State Pharmaceutical Association and my address to the 1926 Meeting of the Wisconsin Pharmaceutical Association.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

CHICAGO.

The 167th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, was held May 17, 1927. Prior to the meeting an enjoyable dinner was served at the Hotel La Salle.

President Gathercoal presented the speaker of the evening, Dr. Anton Hogstad, of the St. Louis College of Pharmacy, who spoke on "Some Colloidal Chemical Aspects of Pharmacognosy." Suggestions for instruction of pharmacognosy were made, by emphasizing the colloidal chemical aspects of plant constituents rather than stressing histological examinations. State of matter should be studied as well as kind of matter. A study of constituents in fresh plants should be made as they are undoubtedly altered by the process of drying, and methods of extraction.

Indications of change in state of matter were made by illustration of digitalis therapy. Absorption of drugs was discussed as well as adsorption of drugs. Diffusion of alkaloids is altered by changing from animal to vegetable membrane, due to the change from positive to negative charges. This course in Pharmacognosy should correlate the kind and state of matter of plant constituents with the chemical study and pharmacological action.

He told of the course in commercial pharmacy being organized at the St. Louis College of Pharmacy, which will be conducted by business men, including salesmanship, buying, wholesale and manufacturing, law and insurance. He advocated the use of fresh and dried herbs with pharmaceutical apparatus for window displays as the best window display to attract attention, increase sales and maintain a professional atmosphere. The pharmacist with his superior knowledge of drugs should use his knowledge of drugs along with the sale of drugs and sundries.

A general discussion followed and a rising vote of thanks was given Dr. Hogstad for his excellent address. His paper was accepted for publication in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

S. W. MORRISON, *Secretary.*

DETROIT.

The May meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at Ann Arbor Friday, May 13th. Dinner was served at the Huron Hills Golf Club at 6:30; after dinner the members motored back to Ann Arbor, where the meeting was called to order, in the Pharmacy and Chemistry Building, by President L. W. Rowe.

The minutes of the previous meeting were read by the Secretary and approved. Chairman Hall of the Program Committee made a report announcing that thirteen new members were added to the Branch this year.

The report of the Committee on Nominations was read; it was accepted and approved. J. H. Webster moved that the Secretary cast a unanimous ballot of the Branch for:

President, A. A. Wheeler; *First Vice-President,* R. H. Blair; *Second Vice-President,* Justin L. Rodgers; *Secretary,* Bernard A. Bialk; *Treas-*

urer, F. F. Ingram, Jr.; *Chairman Program Committee,* R. T. Lakey; *Council of Clerks;* Oliver Williams and E. Smith; Council of Students: Detroit College of Pharmacy, Charles Robertson and Clifford Anderson; University of Michigan, Richard C. Byce and Oliver C. Weinkauff; College of City of Detroit, Carl Smith and I. Helper.

President Rowe thanked the officers for the coöperation given him during his term of office and turned over the chair to President-Elect A. A. Wheeler, who, after brief remarks, introduced the speaker of the evening, Dr. John Sundwal, Professor of Social Hygiene and Public Health of the University of Michigan.

Dr. Sundwal gave a most interesting talk on "Some Recent Tendencies in Public Health." He said the two outstanding accomplishments in Public Health were: The decrease in infant mortality, which has been from 25 deaths for each 1000, in 1900, to 11.8, in 1925, and the increase in the average life of the individual, which in the year 1900 was about 33 years, and in 1925, about 58 years. He quoted some very startling figures on the causes of deaths in the United States, and divided the causes into three groups—Degenerative Diseases, as follows: Heart, 191,226; Arteries, 87,064; Nephritis, 99,320; Cancer, 99,320 and Diabetes, 17,380. Communicable Diseases, Tuberculosis 89,268; Pneumonia, 96,432. External Causes, Suicide, 12,473; Homicides, 8893; Automobile Accidents, 25,000. He said the average man gave comparatively few years of his life to the benefit of society; as an illustration, a hundred college men may be chosen, physically perfect at the age of 25—at the age of 65 only sixty-five would be living: one would be rich; five well-to-do; five working; fifty-four dependent on society. He said that the biggest work to-day for the Public Health Department was the correction of mental diseases. He said, for every College student in the U. S. there was one in the insane asylum—there being 200,000 insane in the various institutions to-day; in New York State alone 60,000 are admitted each year. He said that education was necessary to combat this fast-growing menace of mental diseases, which he attributed partly to the vast throngs of "ne'er-do-wells" who do things on impulses rather than thinking.

W. L. Scoville complimented Dr. Sundwal on his most interesting and enlightening talk and suggested a rising vote of thanks for the speaker, which was enthusiastically given by the assembly.

J. H. Webster commented on the coöperation of the pharmacist and the Health authorities in bringing about the increase in the average life of man and the marked decrease in the more serious communicable diseases. He appealed to the pharmacists to lend their aid in this important work. Mr. Hall commented on the splendid talk and suggested that the information given by Dr. Sundwal be published so that those who missed this opportunity of hearing the speaker, may benefit by reading some of the startling figures he quoted from statistics compiled by the Bureau of Public Health.

Mr. Rowe moved a rising vote of thanks to Dean Edward Kraus for his part in bringing about this meeting and the hospitality shown the Detroit Branch at the Huron Hills Golf Club. After a rising vote of thanks, Dean Kraus said that the credit for the success of this meeting was in great part due to Professors C. C. Glover and C. H. Stocking and his staff for whom Mr. Webster suggested a rising vote of thanks, which was given.

BERNARD A. BIALK, *Secretary.*

PHILADELPHIA.

The final meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, May 10th, at the P. A. R. D. building.

The minutes of the April meeting were read by the Secretary and approved. Four new contributing members were announced as follows: W. B. Hibbs, 2301 Spruce St., E. T. Hahn, 1242 N. 53rd St., B. G. Clapham, Haynes and Morton Sts., Germantown, W. H. House, 50th and Brown Sts., all of Philadelphia, Pa.

The Secretary read several communications relative to the A. PH. A. headquarters building, and general discussion upon this subject followed. The executive committee was given the power to act relative to sending out letters or cards to the A. PH. A. members with data on the headquarters building.

Prof. Robert L. Hobart, Instructor of Merchandising at the Wharton School of Commerce at the University of Pennsylvania, was the speaker of the evening. Prof. Hobart gave one of those wide awake and vital talks based upon "Merchandising for the Summer Months." He took the viewpoint of the consumer and in a very interesting way dwelt on the location of the store, the arrangement of merchandise,

the specialties, salesmanship and service features, such as deliveries, fine packages, conveniences, cashing checks, telephone service, etc. His talk was one which would be of immense value to many retailers at this time of year for it would wake them up and put them on their toes with new ideas for the summer months, when business is naturally at an ebb. Considerable discussion followed Mr. Hobart's remarks and he was given a rising vote of thanks by those present.

ADLEY B. NICHOLS, *Secretary.*

UNIVERSITY OF WASHINGTON.

The March meeting of the University of the Washington Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was postponed because of conflicting appointments of the speaker. Hence, two meetings were held in April. The first meeting was held April 7th. The speaker was Harry Ayers, permanent Secretary for the Washington State Pharmaceutical Association. Mr. Ayers has devoted his entire time to legislative matters and was in attendance at the spring session of the State Legislature. He presented an interesting talk on the machinery and procedure of passing a bill, outlining the details from the formulation of the bill up to its final approval by the State Executive. He reviewed especially the laws passed that affected the pharmacists of the State, and explained many that were lost or killed. The discussion of the procedure of losing or killing a bill was extremely interesting and even amusing at times. This was the most largely attended meeting of the year so far.

The regular April meeting was held April 28th at Bagley Hall. Mr. S. F. Worswick, of the Taylor Instrument Company, was the speaker. Mr. Worswick gave an illustrated talk on both clinical and house thermometers. He explained the making of a thermometer, the difference between 1-minute and 2-minute clinical thermometers, the important factors concerning expensive thermometers, etc., giving those present all the necessary information to enable them to correctly explain to and instruct the purchaser along the lines of proper use of thermometers. Mr. Worswick emphasized some of the facts presented by relating somewhat humorous incidents connected with that particular fact, which kept his audience keyed up and attentive.

The last meeting of the school year will be held May 26th. This will be in the form of the annual dinner. Election of officers will take place at that time, as well as the presentation of the Branch honor medal and other honors conferred upon the graduating students of the college.—H. A. LANGENHAN, *Secretary.*

LIBRARY AND MUSEUM ITEMS.

Plans to build up at Columbia University the most important business library in this country are under way, Prof. James C. Egbert, director of the school of business, has announced. A unique collection of old and rare books is being developed under the direction of Prof. Robert H. Montgomery. This collection contains treatises whose authors represent, mostly in first editions, nearly all of the great names in the history of accounting.

The foundation of the Eunice Rockwood Oberly Memorial prize, established in memory of Miss Oberly, formerly librarian of the Bureau of Plant Industry, Department of Agriculture was the outcome of the spontaneous expression of the regard of her associates at the time of her death, November 5, 1921. Later contributions were received from her friends and co-workers outside the Department, from her college classmates and from the American Phytopathological Society.

The Oberly Memorial prize is awarded once every two years, the first award of $75 having been made in December 1924, to Max Meisel, formerly of the science division of the New York Public Library, for the first volume of his extensive "Bibliography of American Natural History." The prize of this year, for a bibliography entitled "Price Fixing by Governments," has been awarded to Miss Mary G. Lacy, Mrs. Annie M. Hannay and Miss Emily L. Day, of the Bureau of Agricultural Economics Library in the Department of Agriculture.

An anonymous donor, convinced that many facts of American history remain undiscovered below the Mason-Dixon line, has given Princeton an endowment sufficient to provide for two graduate students whose entire efforts are to be exerted in ferreting out the hidden knowledge of the South. The graduate students are to be selected from Southern universities. It is planned that they spend two years in Princeton University training in American history and a third year in the South, where they will search for Southern history material.

A HALF CENTURY OF THE NATIONAL FORMULARY, 1880–1930.

BY H. A. LANGENHAN.

(*Continued from p. 481, May* JOUR. A. PH. A.)

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
PIX CARBONAS	..	..	..	..	..	..	..	..	..	..	..	L
PIX LITHANTHRACIS	..	..	..	..	..	..	..	..	..	..	L	..
Coal Tar	..	..	..	..	..	..	..	..	..	..	E	E
Pix Carbonas	..	..	..	..	..	..	..	..	..	..	S	..
Pix Lith.	..	..	..	..	..	..	..	..	..	..	A	..
Pix. Carbon.	..	..	..	..	..	..	..	..	..	..	..	A
PLUMBI CARBONAS	104	104	104	104	104	104	104	104	104	..	L	..
Lead Carbonate	..	..	..	..	..	..	..	..	..	..	E	..
White Lead	..	..	..	..	..	..	..	..	..	..	S	..
Plumb. Carb.	..	..	..	..	..	..	..	..	..	..	A	..
PLUMBI IODIDUM	..	..	..	..	105	105	105	105	105	105	L	L
Lead Iodide	..	..	..	..	..	..	..	..	..	..	E	E
Plumb. Iod.	..	..	..	..	..	..	..	..	..	..	A	A
PLUMBI OXIDUM RUBRUM	..	..	..	106	..	..	..	..	..	..	L	L
Red Oxide of Lead	..	..	..	..	..	..	..	..	..	..	E	E
Red Lead	..	..	..	..	..	..	..	..	..	..	S	S
Plumb. Oxid. Rub.	..	..	..	..	..	..	..	..	..	..	A	A
POPULI GEMMÆ	..	..	..	..	..	..	..	..	..	..	L	L
Balsam Popular Buds	..	..	..	..	..	..	..	..	..	..	E	E
Balm of Gilead Buds	..	..	..	..	..	..	..	..	..	..	S	S
Pop. Gem.	..	..	..	..	..	..	..	..	..	..	A	A
POTASSA SULPHURATA	107	107	107	107	107	107	107	107	107	L	107	107
Sulphurated Potassa	..	..	..	..	..	..	..	..	..	E	..	..
Liver of Sulphur	..	..	..	..	..	..	..	..	..	S	..	..
POTASSII CHLORIDUM	..	..	..	..	..	..	..	..	..	..	L	L
Potassium Chloride	..	..	..	..	..	..	..	..	..	..	E	E
Pot. Chlorid.	..	..	..	..	..	..	..	..	..	..	A	A
POTASSII HYPOPHOSPHIS	..	..	..	..	..	..	108	108	108	108	108	L
Potassium Hypophosphite	..	..	..	..	..	..	..	..	..	..	..	E
Pot. Hypophos.	..	..	..	..	..	..	..	..	..	..	..	A
POTASSII SULPHAS	109	109	109	109	109	109	109	109	109	109	L	L
Potassium Sulphate	..	..	..	..	..	..	..	..	..	..	E	E
Pot. Sulph.	..	..	..	..	..	..	..	..	..	..	A	A
PRUNUM	..	..	..	110	110	..	..	..	..	..	L	L
Prune	..	..	..	..	..	..	..	..	..	..	E	E
PULSATILLA	..	..	..	..	..	..	..	111	111	..	L	L
Pulsatilla	..	..	..	..	..	..	..	..	..	..	E	E
Pasque Flower	..	..	..	..	..	..	..	..	..	..	S	S
Pulsatil.	..	..	..	..	..	..	..	..	..	..	A	A
PUMEX	..	..	..	..	..	..	..	..	..	..	L	L
Pumice	..	..	..	..	..	..	..	..	..	..	E	E

104—See **PLUMBI CARBONAS**, U. S. P.
105—See **PLUMBI IODIDUM**, U. S. P.
106—See **PLUMBI OXIDUM RUBRUM**, U. S. P.
107—See **POTASSA SULPHURATA**, U. S. P.
108—See **POTASSII HYPOPHOSPHIS**, U. S. P.
109—See **POTASSII SULPHAS**, U. S. P.
110—See **PRUNI PULPA**, U. S. P.
111—See **PULSATILLA**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
QUERCUS	112	112	112	112	112	112	112	112	112	112	L	L
Quercus	..	..	..	..	..	..	..	..	..	..	E	E
White Oak Bark	..	..	..	..	..	..	..	..	..	..	S	S
Querc.	..	..	..	..	..	..	..	..	..	..	A	A
QUILLAJA	..	..	..	..	..	..	..	113	113	113	L	L
Quillaja	..	..	..	..	..	..	..	..	..	..	E	E
Soap-tree Bark	..	..	..	..	..	..	..	..	..	..	S	S
QUINIDINA	..	..	..	..	..	..	..	..	..	..	L	L
Quinidine	..	..	..	..	..	..	..	..	..	..	E	E
Quinid.	..	..	..	..	..	..	..	..	..	..	A	A
QUININÆ GLYCEROPHOSPHAS	..	..	..	..	..	..	..	..	..	..	L	..
Quinine Glycerophosphate	..	..	..	..	..	..	..	..	..	..	E	..
Quinine Glycerinophosphate	..	..	..	..	..	..	..	..	..	..	S	..
Quin. Glycerophos.	..	..	..	..	..	..	..	..	..	..	A	..
QUININÆ HYPOPHOSPHIS	..	..	..	..	..	..	..	..	..	..	L	..
Quinine Hypophosphite	..	..	..	..	..	..	..	..	..	..	E	..
Quin. Hypophos.	..	..	..	..	..	..	..	..	..	..	A	..
QUININÆ VALERAS	..	..	..	..	..	114	114	114	114	..	L	..
Quinine Valerate	..	..	..	..	..	..	..	..	..	..	E	..
Quin. Valer.	..	..	..	..	..	..	..	..	..	..	A	..
RENNINUM	..	..	..	..	..	..	..	..	..	..	L	L
Rennin	..	..	..	..	..	..	..	..	..	..	E	E
RHAMNUS CATHARTICA	..	..	115	..	..	..	..	..	..	..	L	L
Rhamnus Cathartica	..	..	..	..	..	..	..	..	..	..	E	E
Buckthorn Berries	..	..	..	..	..	..	..	..	..	..	S	S
Baccæ Spinæ Cervinæ	..	..	..	..	..	..	..	..	..	..	S	S
Rham. Cath.	..	..	..	..	..	..	..	..	..	..	A	..
Rham. Cathart.	..	..	..	..	..	..	..	..	..	..	..	A
RHUS GLABRA	116	116	116	116	116	116	116	116	116	116	L	116
Rhus Glabra	..	..	..	..	..	..	..	..	..	..	E	..
Sumac Berries	..	..	..	..	..	..	..	..	..	..	S	..
Rhus. Glab.	..	..	..	..	..	..	..	..	..	..	A	..
RUBI FRUCTUS	..	..	..	..	..	..	..	..	..	..	L	..
Blackberries	..	..	..	..	..	..	..	..	..	..	E	..
RUBI IDÆI FRUCTUS	..	..	..	..	..	..	..	117	117	..	L	L
Raspberries	..	..	..	..	..	..	..	..	..	..	E	E
Rub. Id. Fruct.	..	..	..	..	..	..	..	..	..	..	..	A
RUBUS	118	118	118	118	118	118	118	118	118	118	L	L
Rubus	..	..	..	..	..	..	..	..	..	..	E	E
Blackberry Bark	..	..	..	..	..	..	..	..	..	..	S	S
RUMEX	..	..	..	..	..	119	119	119	119	..	L	L
Rumex	..	..	..	..	..	..	..	..	..	..	E	E
Yellow Dock	..	..	..	..	..	..	..	..	..	..	S	S
Curled Dock	..	..	..	..	..	..	..	..	..	..	S	S

112—See **QUERCUS**, U. S. P.
113—See **QUILLAJA**, U. S. P.
114—See **QUININE VALERAS**, U. S. P.
115—See **RHAMNI BACCA**, U. S. P.
116—See **RHUS GLABRA**, U. S. P.
117—See **RUBUS IDAEUS**, U. S. P.
118—See **RUBUS**, U. S. P.
119—See **RUMEX**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
SABAL	..	..	..	..	..	..	..	..	..	120	120	L
Sabal	..	..	..	..	..	..	..	..	..	..	..	E
Saw Palmetto Berries	..	..	..	..	..	..	..	..	..	..	..	S
SAMBUCUS	121	121	121	121	121	121	121	121	121	..	L	L
Sambucus	..	..	..	..	..	..	..	..	..	..	E	E
Elder Flowers	..	..	..	..	..	..	..	..	..	..	S	S
Sambuc.	..	..	..	..	..	..	..	..	..	..	A	A
SANGUINARIA	122	122	122	122	122	122	122	122	122	122	122	L
Sanguinaria	..	..	..	..	..	..	..	..	..	..	..	E
Blood Root	..	..	..	..	..	..	..	..	..	..	..	S
Sanguin.	..	..	..	..	..	..	..	..	..	..	..	A
SANTALUM ALBUM	..	..	..	..	..	..	..	..	..	..	L	L
Sandal Wood	..	..	..	..	..	..	..	..	..	..	E	E
White Sandal Wood	..	..	..	..	..	..	..	..	..	..	S	S
Santal. Alb.	..	..	..	..	..	..	..	..	..	..	A	A
SASSAFRAS	123	123	123	123	123	123	123	123	123	123	123	L
Sassafras	..	..	..	..	..	..	..	..	..	..	..	E
Sassaf.	..	..	..	..	..	..	..	..	..	..	..	A
SASSAFRAS MEDULLA	..	124	..	124	124	124	124	124	124	124	L	L
Sassafras Pith	..	..	..	..	..	..	..	..	..	..	E	E
Sassaf. Med.	..	..	..	..	..	..	..	..	..	..	A	A
SCOPARIUS	..	125	..	125	125	125	125	125	125	125	L	L
Scoparius	..	..	..	..	..	..	..	..	..	..	E	E
Broom Tops	..	..	..	..	..	..	..	..	..	..	S	S
Scopar.	..	..	..	..	..	..	..	..	..	..	A	A
SCUTELLARIA	..	..	..	..	..	126	126	126	126	126	L	L
Scutellaria	..	..	..	..	..	..	..	..	..	..	E	E
Skullcap	..	..	..	..	..	..	..	..	..	..	S	S
Scutell.	..	..	..	..	..	..	..	..	..	..	A	A
SENECIO	..	..	..	..	..	..	..	..	..	..	L	L
Senecio	..	..	..	..	..	..	..	..	..	..	E	E
Life Root	..	..	..	..	..	..	..	..	..	..	S	S
SODII ARSENAS	..	..	..	..	..	..	127	127	127	127	127	L
Sodium Arsenate	..	..	..	..	..	..	..	..	..	..	..	E
Natrii Arsenas, P. I.	..	..	..	..	..	..	..	..	..	..	..	S
Sod. Arsen.	..	..	..	..	..	..	..	..	..	..	..	A
SODII ARSENAS EXSICCATUS	..	..	..	..	..	..	..	..	..	128	128	L
Exsiccated Sodium Arsenate	..	..	..	..	..	..	..	..	..	..	..	E
Sod. Arsen. Exsic.	..	..	..	..	..	..	..	..	..	..	..	A
SODII CARBONAS EXSICCATUS	129	129	129	129	129	129	129	129	129	L	..	..
Dried Sodium Carbonate	..	..	..	..	..	..	..	..	..	E	..	..
SODII GLYCEROPHOSPHAS	..	..	..	..	..	..	..	..	..	..	130	L
Sodium Glycerophosphate	..	..	..	..	..	..	..	..	..	..	..	E

120—See **SABAL**, U. S. P.
121—See **SAMBUCUS**, U. S. P.
122—See **SANGUINARIA**, U. S. P.
123—See **SASSAFRAS**, U. S. P.
124—See **SASSAFRAS MEDULA**, U. S. P.
125—See **SCOPARIUS**, U. S. P.
126—See **SCUTELLARIA**, U. S. P.
127—See **SODII ARSENAS**, U. S. P.
128—See **SODII ARSENAS EXSICCATUS**, U. S. P.
129—See **SODII CARBONAS EXSICCATUS**, U. S. P.
130—See **SODII GLYCEROPHOSPHAS**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
Sodium Glycerinophosphate	..	..	..	..	..	..	..	..	..	..	..	S
Sod. Glycerophos.	..	..	..	..	..	..	..	..	..	..	..	A
SODII HYPOPHOSPHIS	..	..	..	..	..	..	131	131	131	131	131	L
Sodium Hypophosphite	..	..	..	..	..	..	..	..	..	..	..	E
Sod. Hypophos.	..	..	..	..	..	..	..	..	..	..	..	A
SODII PERBORAS	..	..	..	..	..	..	..	..	..	..	132	L
Sodium Perborate	..	..	..	..	..	..	..	..	..	..	..	E
Sod. Perbor.	..	..	..	..	..	..	..	..	..	..	..	A
SOLANUM	..	..	..	..	..	..	..	..	..	..	L	L
Solanum	..	..	..	..	..	..	..	..	..	..	E	E
Horse-nettle Berries	..	..	..	..	..	..	..	..	..	..	S	S
Solan.	..	..	..	..	..	..	..	..	..	..	A	A
STILLINGIA	..	133	..	133	133	133	133	133	133	133	133	L
Stillingia	..	..	..	..	..	..	..	..	..	..	..	E
Queen's Root	..	..	..	..	..	..	..	..	..	..	..	S
Stilling.	..	..	..	..	..	..	..	..	..	..	..	A
STRONTII CARBONAS	..	..	..	..	..	..	..	..	..	..	L	..
Strontium Carbonate	..	..	..	..	..	..	..	..	..	..	E	..
Stront. Carb.	..	..	..	..	..	..	..	..	..	..	A	..
STRYCHNINA	..	..	..	134	134	134	134	134	134	134	134	L
Strychnine	..	..	..	..	..	..	..	..	..	..	..	E
Strych.	..	..	..	..	..	..	..	..	..	..	..	A
STRYCHNINÆ GLYCEROPHOSPHAS	..	..	..	..	..	..	..	..	..	..	L	..
Strychnine Glycerophosphate	..	..	..	..	..	..	..	..	..	..	E	..
Strychnine Glycerinophosphate	..	..	..	..	..	..	..	..	..	..	S	..
Strych. Glycerophos.	..	..	..	..	..	..	..	..	..	..	A	..
STRYCHNINÆ VALERAS	..	..	..	..	..	..	..	..	..	..	L	..
Strychnine Valerate	..	..	..	..	..	..	..	..	..	..	E	..
Strych. Valer.	..	..	..	..	..	..	..	..	..	..	A	..
SUCCUS CITRI	..	..	..	..	..	..	..	..	..	..	L	..
Lime Juice	..	..	..	..	..	..	..	..	..	..	E	..
Suc. Cit.	..	..	..	..	..	..	..	..	..	..	A	..
SUCCUS POMORUM	..	..	..	..	..	..	..	..	..	..	L	L
Fresh Apple Juice	..	..	..	..	..	..	..	..	..	..	E	E
Suc. Pomor.	..	..	..	..	..	..	..	..	..	..	A	A
TALCUM PURIFICATUM	..	..	..	..	..	..	..	L	L	135	135	135
Purified Talcum	..	..	..	..	..	..	..	E	E	..	..	..
TAMARINDUS	136	136	136	136	136	136	136	136	136	136	L	L
Tamarind	..	..	..	..	..	..	..	..	..	..	E	E
Tamarind.	..	..	..	..	..	..	..	..	..	..	A	A
TARAXACUM	..	137	137	137	137	137	137	137	137	137	137	L
Dandelion	..	..	..	..	..	..	..	..	..	..	..	E
Tarax.	..	..	..	..	..	..	..	..	..	..	..	A

131—See **SODII HYPOPHOSPHIS**, U. S. P.
132—See **SODII PERBORAS**, U. S. P.
133—See **STILLINGIA**, U. S. P.
134—See **STRYCHNINA**, U. S. P.
135—See **TALCUM PURIFICATUM**, U. S. P.
136—See **TAMARINDUS**, U. S. P.
137—See **TARAXACUM**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.†											
	20	30	30*	40	50	60	70	80	90	00	10	20
TEREBINTHINA	138	138	138	138	138	138	138	138	138	138	L	L
Turpentine	..	..	..	..	..	..	..	..	..	..	E	E
Terebinth	..	..	..	..	..	..	..	..	..	..	A	A
TEREBINTHINA LARCIS	..	..	..	..	..	..	..	..	..	..	L	..
Venice Turpentine	..	..	..	..	..	..	..	..	..	..	E	..
Larch Turpentine	..	..	..	..	..	..	..	..	..	..	S	..
Terebinth. Laric	..	..	..	..	..	..	..	..	..	..	A	..
THUJA	..	..	..	..	..	..	..	139	..	..	L	L
Thuja	..	..	..	..	..	..	..	..	..	..	E	E
Arbor Vitæ	..	..	..	..	..	..	..	..	..	..	S	S
THYMUS	..	..	..	..	..	..	..	..	..	..	L	L
Thyme	..	..	..	..	..	..	..	..	..	..	E	E
TONGA	..	..	..	..	..	..	..	..	..	..	..	L
Tonga	..	..	..	..	..	..	..	..	..	..	..	E
TRIFOLIUM	..	..	..	..	..	..	..	..	..	..	L	L
Trifolium	..	..	..	..	..	..	..	..	..	..	E	E
Red Clover Blossoms	..	..	..	..	..	..	..	..	..	..	S	S
Trifol	..	..	..	..	..	..	..	..	..	..	A	A
TRILLIUM	..	..	..	..	..	..	..	..	..	..	L	L
Trillium	..	..	..	..	..	..	..	..	..	..	E	E
Beth Root	..	..	..	..	..	..	..	..	..	..	S	S
Trill.	..	..	..	..	..	..	..	..	..	..	A	A
TRITICUM	..	..	..	..	..	..	..	140	140	140	140	L
Dog Grass	..	..	..	..	..	..	..	..	..	..	..	E
Couch Grass	..	..	..	..	..	..	..	..	..	..	..	S
Tritic	..	..	..	..	..	..	..	..	..	..	..	A
VANILLA	..	..	..	..	..	141	141	141	141	141	L	L
Vanilla	..	..	..	..	..	..	..	..	..	..	E	E
Vanilla Bean	..	..	..	..	..	..	..	..	..	..	S	S
VERATRINA	..	..	..	142	142	142	142	142	142	142	142	L
Veratrine	..	..	..	..	..	..	..	..	..	..	..	E
Veratria	..	..	..	..	..	..	..	..	..	..	..	S
Veratrin	..	..	..	..	..	..	..	..	..	..	..	A
VERBASCI FLORES	..	..	..	..	..	..	..	..	..	..	L	L
Mullein Flowers	..	..	..	..	..	..	..	..	..	..	E	E
Verbasc. Flor	..	..	..	..	..	..	..	..	..	..	A	A
VERBASCI FOLIA	..	..	..	..	..	..	..	..	..	..	L	L
Mullein Leaves	..	..	..	..	..	..	..	..	..	..	E	E
Verbas. Fol	..	..	..	..	..	..	..	..	..	..	A	A
VERBENA	..	..	..	..	..	..	..	..	..	..	L	..
Verbena	..	..	..	..	..	..	..	..	..	..	E	..
Blue Vervain	..	..	..	..	..	..	..	..	..	..	S	..
Verben	..	..	..	..	..	..	..	..	..	..	A	..
VIBURNUM OPULUS	..	..	..	..	..	..	..	..	143	143	L	..
Viburnum Opulus	..	..	..	..	..	..	..	..	..	..	E	..
High Bush Cranberry Bark	..	..	..	..	..	..	..	..	..	..	S	..
Viburn. Opul	..	..	..	..	..	..	..	..	..	..	A	..

138—See **TEREBINTHINA**, U. S. P.
139—See **THUJA**, U. S. P.
140—See **TRITICUM**, U. S. P.
141—See **VANILLA**, U. S. P.
142—See **VERATRINA**, U. S. P.
143—See **VIBURNUM OPULUS**, U. S. P.

N. F. Titles, Synonyms and Abbreviations.	Issues of U. S. P. and N. F.† 20	30	30*	40	50	60	70	80	90	00	10	20
VIBURNUM PRUNIFOLIUM	..	..	..	..	..	..	..	144	144	144	144	L
Viburnum	..	..	..	..	..	..	..	..	..	..	..	E
Black Haw	..	..	..	..	..	..	..	..	..	..	..	S
Viburn. Prun.	..	..	..	..	..	..	..	..	..	..	..	A
XANTHOXYLI	..	..	..	..	..	..	..	..	..	..	L	L
Prickley Ash Berries	..	..	..	..	..	..	..	..	..	..	E	E
Xanthox. Fruct.	..	..	..	..	..	..	..	..	..	..	A	A
ZEA	..	..	..	..	..	..	..	..	145	145	L	L
Zea	..	..	..	..	..	..	..	..	..	..	E	E
Corn Silk	..	..	..	..	..	..	..	..	..	..	S	S
ZEDOARIA	..	..	..	..	..	..	..	..	..	..	L	L
Zedoaria	..	..	..	..	..	..	..	..	..	..	E	E
Zedoar.	..	..	..	..	..	..	..	..	..	..	A	..
ZINCI OLEO-STEARAS	..	..	..	..	..	..	..	..	..	L	..	..
Oleo-Stearate of Zinc	..	..	..	..	..	..	..	..	..	E	..	..
ZINCI PHENOLSULPHONAS	..	..	..	..	..	..	..	..	..	146	146	L
Zinc Phenolsulphonate	..	..	..	..	..	..	..	..	..	..	..	E
Zinc Sulphocarbolate	..	..	..	..	..	..	..	..	..	..	..	S
Zinc. Phenolsulph.	..	..	..	..	..	..	..	..	..	..	..	A

144—See **VIBURNUM PRUNIFOLIUM**, U. S. P.
145—See **ZEA**, U. S. P.
146—See **ZINCI PHENOLSULPHONATE**, U. S. P.

OREGON AGRICULTURAL COLLEGE, SCHOOL OF PHARMACY, HEALTH SHOW AND EDUCATIONAL EXPOSITION.

The 1927 health show of the School of Pharmacy, held in connection with the annual college educational exposition, was the most successful exhibit ever put on by the School of Pharmacy. By means of especially prepared displays, it was the aim to show various simple methods used to maintain good health. A large doll and small water bottles were used to show the points on the body where a water bottle should be applied to relieve congestion and pain. Medicine cabinets were on display and visitors were furnished with a printed list of household remedies. Two bulletins, "How to Avoid Catching Cold" and "First Aid Suggestions," were also distributed. A card, with a bath thermometer, showed the effect of different temperatures of the bath on the human body. There was also an exhibit showing various colored chemicals, crystallized on copper wire. In the laboratory, students' conducted experiments showing the distillation of oil of peppermint, the making of solid alcohol and the manufacture of several pharmaceutical preparations, such as emulsions, lotions and cold creams.

A COLLECTION OF POLISH DRUGS.

Presented by Prof. Muszynski to London Museum.

Angelica Sylvestris, Anthyllis vulneraris, Arnica montan, Artemisia Absinthium, Briza media, Carex hirta, Centaurea Cyanus, Cetaurea pulchella, Chimaphila umbellata, Equisetum arvense, Equisetum hyemale, Equisetum limosum, Eriophorum vaginatum, Fragaria vesca, Geranium palustre, Geum rivale, Gladiolus communis, Hierochloe borealis, Hypericum perforatum, Jasione montana, Ledum palustre, Lythrum Salicaria, Matricaria Chamomilla, Melilotus officinalis, Mentha aquatica, Mentha crispa, Mentha piperita, Menyanthes trifoliata, Nymphoea alba, Pedicularis palustris, Peucedanum palustre, Polygala vulgaris, Polygonum Bistorta, Polypodium Dryopteris, Potentilla argentea, Potentilla Tormentilla, Prunella vulgaris, Pyrola chlorantha, Pyrus Aucuparia, Rumex Hydrolapathum, Ruta graveolens, Saponaria officinalis, Saxifraga granulata, Scrophularia nodosa, Silene Cucubalus, Silene nutans, Spiræa Filipendula, Thymus Serpyllum, Trifolium montanum, Vaccinium Vitis Idæ, Valeriana officinalis, Veronica officinalis.

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, R. P. FISCHELIS, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY. *Ex-Officio Members:* T. J. Bradley, *President;* GEORGE JUDISCH, A. G. HULETT, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* JACOB DINER, *Chairman of the House of Delegates.*

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NEW AND NONOFFICIAL REMEDIES.

(See Editorial of this issue, p. 503.)

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

MERCURIC SALICYLATE (See "New and Nonofficial Remedies," 1926, p. 247).

The following dosage forms have been accepted:

Glaseptic Ampoules Mercury Salicylate-P. D. & Co., 0.065 Gm. (1 grain): Each cubic centimeter contains mercuric salicylate, 0.065 Gm.; apothesine, 0.01 Gm.; in olive oil, 1 cc.
Prepared by Parke, Davis & Co., Detroit.

Glaseptic Ampoules Mercury Salicylate-P. D. & Co., 0.13 Gm. (2 grains): Each cubic centimeter contains mercuric salicylate, 0.13 Gm.; apothesine, 0.01 Gm. in olive oil, 1 cc.
Prepared by Parke, Davis & Co., Detroit.

MERCURIC SUCCINIMIDE (See" New and Nonofficial Remedies," 1926, p. 248).

The following dosage form has been accepted:

Glaseptic Ampoules Mercury Succinimide-P. D. & Co., 0.01 Gm. (1/6 grain): Each cubic centimeter contains mercuric succinimide-N. N. R., 0.01 Gm.; apothesine, 0.005 Gm.; in physiological solution of sodium chloride, 1 cc.
Prepared by Parke, Davis & Co., Detroit.

—From *Jour. A. M. A.*, April 30, 1927.

COD-LIVER OIL (See "New and Nonofficial Remedies," 1926, p. 118).

Viking Palatable Cod-Liver Oil.—Cod-liver oil containing 0.2 per cent of benzaldehyde. Its fat soluble vitamin A content is such that 0.002 Gm. per day is sufficient to initiate growth in the albino rat.

Dosage.—2 cc. (30 minims) twice daily for infants; 4 cc. (1 fluidrachm) three times daily for adults.

Manufactured by Alv. Jensen, Oslo, Norway (Sigurd E. Roll, Chicago, distributor). No U. S. Patent. U. S. trademark 216,768.

Viking palatable cod-liver oil is mixed with chloroform and a few drops of strong sulphuric acid added: the sediment has a dark violet or brownish color.

Young albino rats are fed on a diet deficient in vitamin A (with casein as the protein ingredient) until growth, as indicated by the graphic record of gains in weight, ceases; when the diet receives an addition of viking palatable cod-liver oil in amounts to induce a resumption of growth; not more than 0.002 Gm. per day are required.

ANTIRABIC VACCINE (See "New and Nonofficial Remedies," 1926, p. 341). United States Standard Products Company, Woodworth, Wis.

Rabies Vaccine.—U. S. P. (Semple Method).—An antirabic vaccine prepared according to the general method of David Semple (phenol killed). The brains of rabbits killed after inoculation with fixed virus rabies are placed in a bottle containing beads and 1 per cent phenol solution. The bottle is thoroughly shaken, the resultant emulsion passed through a 100-mesh screen and sufficient 1 per cent phenol solution added to yield an 8 per cent suspension of brain substance. The emulsion is incubated at 37° C. for twenty-four hours and then diluted with an equal volume of physiological solution of sodium chloride so that the finished product contains 4 per cent of brain substance in 0.5 per cent phenol. Marketed in packages of fourteen syringes, each containing 2 cc. The content of a syringe is administered daily over a period of fourteen days.

—From *Jour. A. M. A.*, May 21, 1927.

EPHEDRINE HYDROCHLORIDE-SWAN-MYERS (See *Jour. A. M. A.*, April 16, 1927, p. 1235).

The following dosage forms have been accepted:

Ampoules Ephedrine Hydrochloride-Swan-Myers, 0.05 Gm., 1 cc.

Capsules Ephedrine Hydrochloride-Swan-Myers, 0.025 Gm.

Solution Ephedrine Hydrochloride-Swan-Myers, 3%: It is preserved with chlorbutanol, 0.5 per cent.

OVARIAN HORMONE-SQUIBB.—A sterile, aqueous solution representing the physio-

logically active principle of the whole ovary. It is standardized in terms of its effect on spayed albino rats, one rat unit being the quantity necessary to induce estrus as judged by the smear method within three days in an ovariectomized, sexually mature rat weighing approximately 140 Gm.

Actions and Uses.—See Ovary, "New and Nonofficial Remedies," 1927, p. 272.

Dosage.—Ovarian Hormone-Squibb is administered by hypodermic injection. For recent cases of amenorrhea, artificial or natural menopause, from 50 to 100 units is given in a series of injections over a period of from three to five days, an attempt being made, if possible, to time these injections so that the last one shall be given from one to five days before the calculated expected menstruation. For long existing cases of amenorrhea, artificial or natural menopause, much larger doses may be administered; from 250 to 400 units may be given in a series of injections over a period of from five to ten days. If menstruation is not established, another course may be administered after an interval of ten days.

Manufactured by E. R. Squibb & Sons, New York. No U. S. patent or trademark.

Ovarian Hormone-Squibb, 50 units, 5 cc.: each cubic centimeter represents 10 units.

Ovarian Hormone-Squibb is prepared from fresh ovaries of the sow by macerating and extracting with alcohol and concentrating the extract. A series of fractionations are made with acetone and ether to remove the proteins, cholesterol and phospholipins. The extract is dissolved in distilled water containing sodium chloride, assayed by the method of Allen and Doisy (*Am. J. Anat.* 34, 133 (1924)) to determine its strength in rat units and adjusted to the desired strength and to an acidity of p_H 5.5.

—From *Jour. A. M. A.*, May 28, 1927.

PERSONAL AND NEWS ITEMS.

At the fifty-ninth commencement of the Massachusetts College of Pharmacy, the honorary degree of Doctor of Pharmacy was awarded to **Elie H. La Pierre,** of the class of 1880, senior professor in the College; **Wilbur L. Scoville,** Detroit, Michigan, of the class of 1889, *Chairman* of the Committee on the "National Formulary," and formerly a professor in the College; and **Theodore J. Bradley,** Dean of the College since 1912 and *President* of the AMERICAN PHAPMACEUTICAL ASSOCIATION.

Dr. Albert Schneider of North Pacific College of Oregon will spend most of the summer vacation in California. He is contemplating another trip into the Mohave country for the purpose of continuing his study of the pseudo-trachoma which is endemic in that region. He will coöperate with Dr. L. L. Stanley of the California State Prison in his work on the use of testicular substance in treating certain diseases and in correcting certain criminal tendencies due to glandular imbalance. With the assistance of George Salstrom, laboratory technician at the college, he will carry on a series of tests and observations with a high-capacity ozone generator, with special reference to the use of ozone for sterilizing purposes. One complete experimental outfit is installed at North Pacific College and several portable outfits are now under construction under the direction of the inventor Michel de Keyser of Belgium.

Prof. Ralph E. Terry has taken a position with the University of Illinois School of Pharmacy and will sever his connection with the Oregon Agricultural College School of Pharmacy, September 1st.

John S. Jamieson, chief medical officer of the Bureau of Chemistry of the Department of Agriculture, has resigned, effective May 15th, to accept a position with Sterling Products, Inc., New York and Wheeling, W. Va. Dr. Jamieson has been with the Bureau of Chemistry for half a dozen years and prior to that time was with the Public Health Service and the Federal Civil Service Commission.

James C. Munch, pharmacologist for the Bureau of Chemistry has returned from a six weeks' trip during which he visited leading drug manufacturers. The chief purpose of the trip was to arrange for the coöperation of the laboratories of the various drug manufacturers in a study of methods for determining the strength of digitalis. Among the cities visited were St. Louis, Kansas City, Chicago, Indianapolis, Detroit, Boston, Philadelphia and Baltimore.

Sir William S. Glyn-Jones, of the Canadian Proprietary Articles Trade Association—honorary member of the A. PH. A.—has returned from London where he gave evidence before the departmental committee on poisons and pharmacy law. He was one of the speakers at the Ontario Retail Druggists Association at its convention in Hamilton, June 6th to 8th.

Harry Noonan, President of the Drug Products Company, Long Island City, N. Y., a former President of the American Pharmaceutical Manufacturers Association, accompanied by Mrs. Noonan and their son, Richard, sailed May 26th for a six weeks' trip in Belgium, Paris and London. Mr. Noonan attended the International Rotary Convention at

Ostend during the week of June 5th, as an alternate delegate of the Queensboro Rotary Club.

James M. Doran, head of the technical division of the Bureau of Prohibition and for twenty years a chemist in the Bureau of Internal Revenue, has been elevated to the position of Commissioner of Prohibition by appointment of Andrew W. Mellon, Secretary of the Treasury. Mr. Doran displaces Roy A. Haynes, Acting Commissoner. Simultaneously, Secretary Mellon announced the resignation of L. C. Andrews, Assistant Secretary of the Treasury. Seymour Lowman, Elmira, N. Y., succeeds the former.

James M. Doran was born in Grand Forks, N. D., August 17, 1885. Shortly after being graduated from the University of Minnesota with the degree of bachelor of science in chemistry, Mr. Doran entered the Government service, starting as a chemist in the Bureau of Internal Revenue of the Department of the Treasury, July 15, 1907. He has been head of the technical division, operating under the prohibition and industrial alcohol acts, since October 15, 1920.

Dr. Henry G. Bentz, of Buffalo, N. Y., Grand Secretary of the Beta Phi Sigma fraternity, who has been making a tour of the chapters in the Mississippi valley, spent a few days in Iowa City recently, when he was entertained at a dinner given in his honor by Epsilon chapter.

J. Albert Pierce has given up his work in the research department of E. R. Squibb & Sons, New York, and is working for the doctor's degree at Johns Hopkins University.

The citizens of Waco, Texas, celebrated the 25th anniversary of President Samuel Palmer Brooks' election as the head of Baylor University, during the first week in June. Few, if any, citizens of Texas are held in higher esteem than Dr. Brooks. The University is the oldest school in the State having been founded in 1845. The schools of pharmacy and dentistry and nursing are located at Dallas; the other departments and the main University are located in Waco.

Volume 1, No. 1 of the *Bulletin of the Antivenin Institute of America* has been published. This number is full of interesting matter. The first article is on the occurrence and habits of our poisonous snakes by Raymond L. Ditmars. Another contribution is by the well-known specialist, Alfranio do Amaral—"Studies of Neotropical Ophidia." An interesting map is that on the life zones and distribution of rattlesnakes in San Diego County, Cal.

Prof. F. A. Gilfillan, heretofore with the University of Florida, is now a member of the pharmacy faculty of the State College at Corvallis, Ore.

Prof. Ernst T. Stuhr, Instructor of Pharmacognosy and Pharmacology, at the University of Florida, will become a member of the pharmacy faculty of Oregon State Agricultural College.

Duquesne University has announced the following additions to its teaching staff:

Dr. Frank A. Lee, Seattle, will be Assistant Professor of Pharmacy; G. Walker Daubenspeck, formerly of S. Dakota State College, has been engaged as Assistant Professor of Bacteriology and Biology. R. E. Lansbery, for several years Superintendent of Display for the May Drug Co., Pittsburgh, Pa., will give a Laboratory and Class Room Course in Store Decoration and Display, as related to the drug store.

Dr. Joseph Jacobs, a *Vice-President* of the A. PH. A., and prominent pharmacist of Atlanta, Ga., visited the JOURNAL office on June 3rd. He was accompanied by Mrs. Jacobs and their intention is to visit New York, Philadelphia, Washington and other cities. He has given up a trip to Scotland so that he may be present at the annual A. PH. A. convention in St. Louis. In conversation, Dr. Jacobs stated that nine pharmacists were members of the Georgia Legislature.

H. H. Hoffman, Director of drugs and drug stores in Michigan, takes issue with the statement that Idaho has the largest number of druggists in its Legislature, namely, three senators and three representatives. Mr. Hoffman states that the Michigan Legislature has two senators who are pharmacists and nine representatives. In addition to this there are several drug-store proprietors, not registered, who are members of the Michigan legislative body.

Miss Mary A. Fein, for many years Secretary of the Arkansas Pharmaceutical Association, has been given the degree of Ph.G., by Little Rock College. Miss Fein's long connection with pharmacy and the splendid work she has done during the many years of her secretaryship, merits the honor.

Miss Fein has attended a number of the annual conventions of the A. PH. A., and was quite active in the entertainment of the

members at the Hot Springs Convention. She has started a movement to establish a memorial at Little Rock College to the late Frank Schachleiter, formerly one of the most active workers for the A. PH. A. in the Southwest.

J. B. Michels, El Paso, Ill., President of the Illinois Pharmaceutical Association, was elected Mayor of his home city by a large majority.

Merck & Co. has donated supplies of creolin for use among sufferers in the Mississippi flood regions. These have been placed at the disposal of the local chapters of the Red Cross.

The *Squibb Message* for April presented an able and comprehensive editorial on the value of the "National Formulary," its purpose and the advancement made in its several revisions. It is well worth reading because of the history and will, no doubt, bring out some thoughts which may be applied in the pharmacy and propaganda.

The April number of the *Missouri Druggist* is largely a most excellent State Association issue and with it the AMERICAN PHARMACEUTICAL ASSOCIATION is honored by several pages of fine publicity, evidencing a spirit of coöperation.

The May *Maryland Pharmacist* carries as frontispiece an excellent half-tone of the late Dr. John F. Hancock; this is accompanied by a fine tribute to the latter and pharmacists of his day; it depicts most interestingly the changed conditions that have taken place in pharmacy and the drug business during the past several decades.

OBITUARY.

CHARLES H. HUHN.

Charles H. Huhn, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1905, died May 24th. Mr. Huhn had been in poor health for some time, so that his passing was not unexpected, but his death brought sadness to his many friends.

CHARLES H. HUHN.

Mr. Huhn was President of the National Association of Retail Druggists in 1909, and served this organization in various important offices and on committees.

The deceased was born at Brooklyn, Ohio, in 1860. After completing his earlier education Mr. Huhn matriculated at the School of Pharmacy of the University of Michigan and graduated in 1881. For many years Mr. Huhn was connected with Lyman-Eliel Drug Company, the Minneapolis Drug Company, and as director and President of the Northwestern Wholesale Drug Company. In 1899 he opened a retail pharmacy in Minneapolis.

He was a firm believer in organizations and aided in their development. He made a close race for the Mayorality of Minneapolis (1908), losing by only about 150 votes.

Mrs. Huhn died in 1916; a daughter, Miss Hazel B. Huhn, survives her father, whose cheer brightened up the home life and the circles of his associates.

JOHN H. WINKELMANN.

John H. Winkelmann, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1864, formerly in the wholesale drug business as a member of the Winkelmann & Brown Drug Company, Baltimore, died May 22nd at his home in Baltimore. He was eighty-five years old and retired some years ago. He began his business career when twelve years old with the firm of August Vogeler & Co., a forerunner of the Vogeler Drug Company. Eventually he acquired a partnership in this

house and later became President of the Winkelmann & Brown Drug Company. He was also one of the incorporators of the Carr-Lowry Glass Company, which supplied the drug trade with bottles and other glass containers. Two sons and two daughters survive.

Richard V. Mattison, Jr., first Vice-President of the Keasbey & Mattison Company, son of our fellow-member, died May 23rd in a Philadelphia hospital after an illness of two weeks. He was forty-seven years old. Sympathy is expressed.

We regret to learn of the death of John McKesson, 20-year-old son of **Irving McKesson** of the New York Quinine & Chemical Works, New York City, on April 25th in a Norwalk, Conn., hospital as the result of injuries received when his motorcycle and an automobile collided.

SOCIETIES AND COLLEGES.

OFFICERS OF CALIFORNIA PHARMACEUTICAL ASSOCIATION.

The Sacramento convention of California Pharmaceutical Association (May 17th–19th), was brought to a close with a banquet at Hotel Senator. Among the speakers were: Mrs. W. Bruce Philip, President of the California Women's Pharmaceutical Association; J. M. Penland of the N. W. D. A.; M. P. Mears for the Druggists' Research Bureau; Hugh O'Connor, who discussed narcotic laws, and others. President Schaefer's address dealt largely with legislation and conduct of the drug store in its relation to the public. The following officers were elected:

President, W. M. Fulton, Long Beach.

Vice-Presidents, Joseph Huntoon, Visalia; F. W. Vossmeyer, Los Angeles; Marvin Sydenstricker, Sacramento.

Secretary, T. M. Jones, Los Angeles.

Treasurer, Earl Phillips, Los Angeles.

San Diego is the next convention city.

OFFICERS OF OKLAHOMA PHARMACEUTICAL ASSOCIATION.

Among the speakers of the Oklahoma Convention were: Dean D. B. R. Johnson, Robert J. Ruth, Walter D. Adams, Walter H. Cousins, Secretary Samuel C. Henry, S. L. Antonow, J. Will Kelley. The Association will organize district divisions which will coöperate with the State body. The meetings were held in Hutchins Hotel, Oklahoma City. The following officers were elected for the ensuing year:

President, W. M. Kasl, Blackwell.

First Vice-President, W. R. Franklin, McLeod.

Second Vice-President, L. Dale Beaver, Fairfax.

Secretary-Treasurer, H. S. Caldwell, Oklahoma City.

SCIENTIFIC SECTION A. PH. A.

THE SEVENTY-FIFTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION will be held at the Hotel Coronado in St. Louis, Mo., during the week of August 22, 1927.

This is the Diamond Anniversary Meeting and the officers of the ASSOCIATION are planning for the biggest and best convention we have ever had.

Likewise, your officers of the **Scientific Section** are laying plans for bigger, better, more instructive and more interesting sessions than we have ever had before.

In order to do this, however, it is necessary that we have your coöperation and assistance. We are depending upon you for at least one paper upon any subject coming within the scope of your section.

To be assured a prominent place on the program, send the Secretary the title of your paper as soon as possible.

There is no limit as to the length of papers presented but in order that all may have an *equal opportunity* to read their papers, your attention is called to the fact that the "By-Laws" of the Section limit the time allowed for the presentation of each paper to ten minutes, with an additional *five minutes* for discussion.

These rules will be strictly adhered to. Therefore, if your paper is too lengthy to be read in the time allotted, kindly be prepared to present it in abstract.

Owing to the large number of papers to be presented within a limited time, it will be impossible to include illustrated talks in the program.

This ruling, however, does not preclude the use of lantern slides *to illustrate a scientific paper*, so long as the paper can be presented within the allotted time.

All titles of papers, and an abstract (not

over 250 words) of the same must be in the hands of the Secretary by July 1st.

Papers received after July 1st cannot be assured of a place on the program and presentation can only be permitted as time may allow.

The program must be completed by this date in order to have it included in the JOURNAL the month before the meeting.

The value of our meeting depends as much, and sometimes more, upon the character of the discussions as upon the papers themselves.

We are therefore again asking each author to help us enhance the value of the discussion by submitting to the Secretary an abstract of 250 words or less of each paper to be presented.

The Secretary will mimeograph these abstracts and distribute them to the Section members in order that they can determine the papers in which they are most interested and come to the section meetings prepared to intelligently discuss them.

Trusting that you will coöperate with us in making the sessions of the Scientific Section *a big success* by contributing at least one paper this year and that we may receive the **Title and Abstract** of the same before July 1st, we remain

JOHN C. KRANTZ, JR., *Chairman.* PAUL S. PITTENGER, *Secretary.*

Send in your papers—for officers of the Sections see p. X, in Advertising Section.

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION.

By unanimous vote the American Pharmaceutical Manufacturers' Association at the meeting in Asheville, elected the following officers and directors: *President*, R. Lincoln McNeil, Philadelphia; *Vice-Presidents*, George H. Gould, Louisville and E. H. Hessler, New York; *Secretary*, J. G. Searle, Chicago; *Treasurer*, Carl N. Angst, Indianapolis; *Directors*, Ralph R. Patch, Stoneham, Mass.; James E. Bartlett, Indianapolis; R. M. Cain, Indianapolis.

Secretary E. F. Kelly as delegate, represented the AMERICAN PHARMACEUTICAL ASSOCIATION.

RESOLUTIONS ADOPTED.

The Committee on Resolutions, Charles Wesley Dunn, *Chairman*, presented the following resolutions, all of which were unanimously adopted:

Food, Drugs and Insecticide Administration.

Resolved: That the association pledges to the newly created Food, Drug and Insecticide Administration, empowered to make effective or to carry into effect the Federal food and drug and insecticide acts, and to Walter G. Campbell and the officers associated with him in the direction of such administration, its coöperation in the efficient enforcement of the acts pursuant to their beneficent purpose.

Amendment of Food and Drug Acts.

Resolved: That the association does hereby recommend the following amendments of the Federal food and drugs act:—

1. An amendment effective to require the publication of the official methods of analysis under the act, if and to the extent their publication is not otherwise duly had;

2. An amendment effective to provide that a sufficient portion of the official sample taken under the act be forthwith given to the manufacturer or other party interested, for check analysis or examination;

3. An amendment effective to provide that reasonable tolerances shall be allowed with respect to drugs sold under a label declarative of composition, if and to the extent they are not now allowed, which shall apply to variations of manufacture unavoidable under the best commercial practices, and also to variations subsequent to manufacture and beyond the control of the manufacturer. This amendment will be in harmony with that applicable to packaged foods and the declaration of the quantity of their contents.

U. S. P. Convention Representation.

Resolved: That the association does hereby apply for due admission to and participation in the 1920 convention for the revision of the United States Pharmacopœia.

Synthetic Products.

Resolved: That the association disapproves and protests against any governmental rule directed to require that synthetic food or drug products be labeled and sold as "imitations," because (1) the name "synthetic" is the natural and true designation of such products and wholly free from any element of deception; (2) such a rule would be effective to retard the progress of synthetic organic chemistry, the development of which is in the public interest.

INSTITUTE OF CHEMISTRY TO OPEN AT PENN STATE.

The National Institute of Chemistry, recently founded by the American Chemical

Society, will commence operation this summer at Pennsylvania State College with forty-seven courses of study open during the month. The faculty, thirty-five in number, will include Drs. Jean Piccard, Hans Tropsch, E. K. Rideal, J. C. Drummond, James Kendall, Gerald L. Wendt, Frank C. Whitmore, E. W. Mason, Mary L. Willard, J. H. Olewine, Emma P. Carr, Charles P. Smyth, Wheeler P. Davey, Harry N. Holmes, Victor Cofmen, Hugh S. Taylor, A. J. Currier, D. C. Duncan, R. A. Dutcher, A. K. Anderson, W. W. Lisse, E. D. Ries, C. H. Kunsman, G. E. Cohen, R. L. Godschalk, C. F. Smith, D. E. Haley and M. W. White.

The work of the institute will be in charge of a committee of direction headed by Dr. Wendt. There will be daily conferences on "1927 in Chemistry."

SOCIETY FOR HISTORY OF PHARMACY.

As previously reported in the JOURNAL OF A. PH. A., December 1926, p. 1150, there was organized at Innsbruck, Tyrol, in August 1926, a Society for History of Pharmacy. Since then the Society has spread all over Europe and has a membership of 160 in the United States.

The first annual convention of the "Gesellschaft fuer Geschichte der Pharmazie" was held in the historic city of Nuremburg on May 7th and 8th, and was very well attended by representatives of different countries. The meeting was a great success and put the Society on a solid basis. Letters and telegrams were received from many members who were unable to attend.

The following were elected as Corresponding Members: Dr. Carl Bedall in Munich, Dr. Hans Heger and Director H. Lafite, Sr. in Vienna, Prof. Orient in Klausenburg, Editor Ernst Urban in Berlin, Prof. Otto Raubenheimer in Brooklyn, N. Y. The latter and Prof. Leo Suppan in St. Louis were appointed referees for the United States. Those who desire to become members of the Society are invited to address them with their applications.

The new officers elected are as follows:

President, Dr. Ludwig Winkler, Innsbruck, Tyrol; *Secretary*, Apotheker H. Gelder, Berlin; *Treasurer*, Apotheker Georg Urdang, Berlin; *Editor*, Apotheker Fritz Ferchl, Mittenwald, Bavaria; *Historian*, Apotheker W. Zimmermann, Illenau, Baden.

MASSACHUSETTS COLLEGE OF PHARMACY.

Prizes consisting of a nomination to membership and the first year's dues in the AMERICAN PHARMACEUTICAL ASSOCIATION are offered by several officers and teachers. These prizes are awarded to members of the graduating class who have made good averages on the senior work in all subjects and exceptional records in separate subjects as noted.

Pharmacy, offered by Professor La Pierre and awarded to George P. Plansky.

Analytical Chemistry, offered by Dean Bradley and awarded to Thomas E. O'Brien.

Organic Chemistry, offered by Treasurer Godding and awarded to Sidney J. Jackson.

Materia Medica, offered by President Glover and awarded to Louis C. Filadoro.

Commercial Pharmacy, offered by Trustee Ackermann and awarded to David F. Dickson.

SCHOOL OF PHARMACY, UNIVERSITY OF MARYLAND RECEIVES LARGE GIFT.

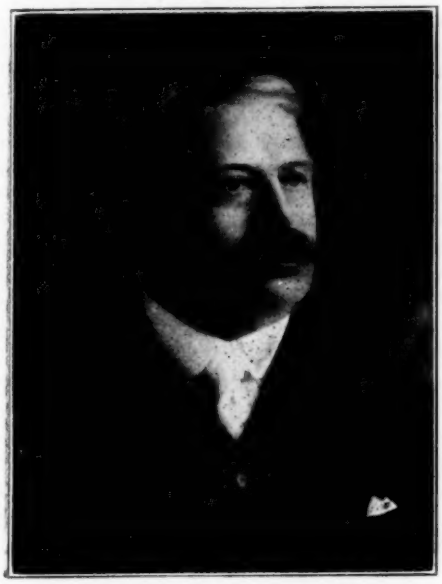
The University of Maryland School of Pharmacy has received from Captain Isaac E. Emerson an endowment of approximately $75,000 to yield $4500 annually for the support of a professorship in Biological Testing and Drug Assaying. It is very pleasing to note that an individual engaged in the drug industries has provided an endowment for pharmacy. The splendid gift should encourage others engaged in the manufacturing and other lines of the drug industries to contribute in a substantial way to the progress of pharmacy.

Captain Emerson also provided for a Pharmacology fellowship in the Medical Department amounting to $1500 annually.

The School of Pharmacy of the University of Maryland—considering the provision recently made for a new building by the State and the endowment—should consider 1927 a very good year. The value of this endowment will be enhanced if others will follow the example set by Captain Emerson.

The annual alumni meeting and banquet was held at Rennert Hotel on June 3rd. An excellent menu and music was further enhanced by the eloquent address of U. S. Senator Millard E. Tydings and that of President Pearson of the University. Toastmaster William J. Lowry, the retiring President of the Alumni Association, performed the duties of office with dignity and good humor which added much to the evening's enjoyment. Prof.

John C. Krantz, Jr., is the new *President; Secretary* Olive Cole and *Treasurer* Frank L. Black were reëlected.



CAPTAIN ISAAC E. EMERSON.

Governor Ritchie and Rev. Dr. Birckhead were the speakers at the Commencement Exercises, June 4th.

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE.

A largely attended reception to Dr. Wilmer Krusen, the recently elected President of the Philadelphia College of Pharmacy and Science, was given May 27th in the Bellevue-Stratford Hotel by the Board of Trustees of the college. Among the guests were many of the city's best known physicians and pharmacists and representatives from the faculties of the University of Pennsylvania, Temple University and other nearby educational institutions and the city's professional clubs and societies.

The 105th annual commencement of the College was held June 8th. Honorary degrees of Master of Pharmacy were conferred on Sir William S. Glyn-Jones, England, Dr. Robert J. Ruth, of Philadelphia and Daniel H. Hills, Spring Lake, N. J. The commencement address was made by Dr. Edgar Fahs Smith, Provost emeritus of the University of Pennsylvania.

The corner-stone of the new College building was laid on June 7th, President Wilmer Krusen of the College officiated; Dr. Alba Johnson, President of Jefferson Medical College, delivered the address of the occasion.

President Theodore J. Bradley assisted in the latter ceremonies.

UNIVERSITY OF PITTSBURGH SCHOOL OF PHARMACY.

The Commencement Exercises of the University of Pittsburgh were held June 2nd. The address was delivered by Dr. Albert Mansbridge of London, England, and the Alumni banquet concluded the annual event.

OFFICERS OF THE PROPRIETARY ASSOCIATION OF AMERICA.

The forty-fifth annual meeting of the Proprietary Association of America was held at the Hotel Traymore, Atlantic City, May 9th and 11th, one of the striking features being the attendance of many of the members of the Canadian Proprietary Association. Secretary E. F. Kelly of the AMERICAN PHARMACEUTICAL ASSOCIATION spoke briefly and extended greetings at one of the early sessions.

Many problems and plans for the future were discussed, including distribution problems, publicity plans for the cultivation of the good will of the public, the present status of the P. A. T. A., chain drug stores, etc.

Frank A. Blair, New York, was reëlected *President* and Charles G. Tyrrell, Rochester, N. Y., was reëlected *Secretary-Treasurer*. The *Vice-Presidents* elected were E. K. Hyde, Buffalo and J. H. Howe, St. Louis. Dr. John F. Murray was elected a member of the Executive Committee.

OFFICERS OF THE MANUFACTURING CHEMISTS' ASSOCIATION.

The annual meeting of the Manufacturing Chemists' Association was held June 1st in New York City, with about 50 representatives of member firms present. Henry Howard, of the Grasselli Chemical Company, Cleveland, was reëlected *President*. Salmon W. Wilder, Merrimac Chemical Company, was elected *Chairman* of the Executive Committee, succeeding A. G. Rosengarten. John I. Tierney was reëlected *Secretary*.

OFFICERS OF KANSAS PHARMACEUTICAL ASSOCIATION.

The following officers were elected at the recent annual meeting of the Kansas Pharmaceutical Association.

President, Walter H. Varnum, Lawrence; *Vice-President*, C. W. Enborg, McPherson; *Second Vice-President*, Henry Kettler, Pittsburgh; *Treasurer*, Earl Shaffer, Sedgwick; *Librarian*, L. D. Havenhill, Lawrence; *Secretary-Manager*, R. R. Hickson, Insurance Building, Lawrence.

The Association now issues a *Weekly News Letter* which will, doubtless, prove of great value and interest for the members.

PHILIP F. ROWSELL (BRITISH PHARMACIST) MEMBER OF BRITISH CHAMBER OF COMMERCE VISITING IN U. S.

Philip F. Rowsell, one of the most prominent figures in British pharmacy is a member of the delegation from the British Chamber of Commerce to the Virginia State Chamber of Commerce. The delegation has been arranged to promote closer British-American friendship, the stimulation of British-American trade and an extended use of the Virginia ports. On their tour they have visited many important business centers east of the Mississippi.

Mr. Rowsell is the only pharmacist member of the delegation and is known to all sections of pharmacy and the drug trade in Great Britain. He is a member of the Council of the Pharmaceutical Society, of the Executives of the Retail Pharmacists' Union, the Chemists' Defense Association and the Proprietary Articles Trade Association, and has held the high office of President or Chairman of these bodies.

He has been thrice Mayor of the historical city of Exeter and in that capacity, exhibited the talents and aptitude for public affairs for which his long and varied training qualified him. We are informed that there is no representative man in pharmacy who is in closer contact with or is so well received by government departments or who is so fully conversant with all phases of pharmaceutical business and politics in Great Britain. He is keenly interested in conditions affecting pharmacy in the United States, and is using the opportunity of his visit for meeting American pharmacists in the different centers and exchanging experiences and views with them.

DR. J. J. ABEL AWARDED WILLARD GIBBS MEDAL.

A man no longer need be old when he reaches the biblical span of threescore years and ten, and Dr. J. J. Abel is a living example of this truth. His latest researches have been among the most important that he has made, and on May 27th the American Chemical Society bestowed on him the Willard Gibbs Medal.

A few months ago, for the first time, Dr. Abel succeeded in forming crystalline insulin.

The next step and the one on which he is now working is toward synthetic manufacture. In 1893 Dr. Abel became professor of pharmacology at Johns Hopkins; he is beloved and highly esteemed.

BERTHELOT MEMORIAL PLANNED.

The centenary of the birth of Eugene Marcelin Berthelot, one of the earliest French industrial chemists, was celebrated May 6th in France with the launching of a national subscription for the erection of a "House of Chemistry." The ceremony took place at the Sorbonne, presided over by M. Painleve, Minister of War. Many illustrious scientists and diplomats of all nations attended.

OFFICERS OF AMERICAN MEDICAL ASSOCIATION.

Dr. William Sidney Thayer of Baltimore, Md., was elected *President-Elect* of the American Medical Association.

Minneapolis was selected for the next annual convention of the Association.

A doctor's diploma was presented to President Coolidge by officers of the Interstate Post Graduate Medical Association of North America. The diploma made the President a fellow of the Association.

Dr. Charles A. Elliott of Chicago, Ill. was elected *Vice-President* succeeding Dr. John O. McReynolds of Dallas, Texas.

The other officers chosen all succeed themselves. They were Dr. Olin S. West, Chicago, Ill., *Secretary;* Dr. A. M. Hayden, Chicago, Ill., *Treasurer;* Dr. F. C. Warnshuis, Grand Rapids, Mich., *Speaker* and Dr. Allen H. Bunce, Atlanta, Ga., *Vice-Speaker;* Dr. Edward B. Hecjel, Philadelphia, Pa. and Dr. Rock Sleyster, Wauwatosa, Wis., were elected to the Board of Trustees.

The following were elected to the judicial council: Dr. Donald McRae, Jr., Council Bluffs, Iowa; Dr. Emmet P. North, St. Louis, Mo.; Dr. Frank H. Lahey, Boston, Mass. and Dr. Frank W. Cregor, Indianapolis, Ind.

Dr. McReynolds, retiring *Vice-President* of the A. M. A., was elected *President* of the Medical Veterans of the World's War.

Mrs. Laura Whelpley, widow of the late Dr. H. M. Whelpley, will give over to the AMERICAN PHARMACEUTICAL ASSOCIATION, among other items the slides with which Dr. Whelpley illustrated his lectures before this organization.

THE PHARMACIST AND THE LAW.

CONVENTION EXPENSES HELD DEDUCTIBLE FROM INCOME.

Expenses incurred in attending meetings of the American Chemical Society and other scientific gatherings are ordinary and necessary business expenses in the case of Alexander Silverman, professor of chemistry at the University of Pittsburgh, according to a ruling by the Board of Tax Appeals.

Prof. Silverman deducted $558.75 from his gross income in 1921 as expenses in attending meetings of the American Chemical Society and the American Ceramic Society for the purpose, as he contended, of keeping thoroughly informed in his field of work and in touch with other scientists, and in order to advance the interests of the University.

The Board held that expenditures of this character and made under such circumstances are deductible as an ordinary and necessary business expense.

FOOD, DRUG AND INSECTICIDE ADMINISTRATION.

The U. S. Department of Agriculture has issued a bulletin of information on the recently organized divisions. "W. G. Campbell, Director of Regulatory Work of the United States Department of Agriculture, will administer the work under the Food, Drug and Insecticide Administration, which takes form on July 1, 1927, according to an announcement by Secretary of Agriculture Jardine. Dr. P. B. Dunbar, now Assistant Chief of the Bureau of Chemistry, will be Assistant Chief of the new administrative unit. This unit, created by an act of Congress, is charged with the enforcement of the Federal Food and Drugs Act, the Tea Inspection Act, the Insecticide and Fungicide Act, the Naval Stores Act, the Import Milk Act and the Caustic Poison Act.

"Mr. Campbell has been connected with the work of enforcement of the Food and Drugs Act since it became effective twenty years ago. He was selected by Dr. H. W. Wiley as chief inspector and in that position directed all of the inspection work under the "pure food law" until 1914 when he was promoted to the position of chief of the Eastern District having charge of both inspection and analytical work in the entire Eastern section of the United States. He was promoted in 1917 to the position of Assistant Chief, Bureau of Chemistry, serving in that capacity until 1921 when he was appointed Acting Chief. He was promoted to the position of Director of Regulatory Work of the Department of Agriculture in 1923, having general supervision of all enforcement work of the entire department. Under his new assignment he will, in addition, have the immediate direction of the work involved in the acts assigned to the Food, Drug and Insecticide Administration.

"Mr. Campbell is a lawyer, having received the A.B. degree from the University of Kentucky in 1902 and the LL.B. degree from the University of Louisville in 1906. He opened a law office in Louisville immediately after completing the course in law and soon became interested in legal phases of food control work, being retained by the Kentucky Experiment Station to look after the enforcement of State food laws in Louisville and its vicinity. A year later he was appointed Chief Inspector in the enforcement of the Food and Drugs Act. Mr. Campbell developed the project system which has done much to increase the efficiency of food law enforcement. This system provides a plan of operation by means of which all the organization units located in different sections of the country work together toward a common end. In this way various forms of adulteration and misbranding are attacked in all sections of the country at once and checked or eliminated entirely with the least expenditure of time and funds. The form of organization and system developed for the enforcement of the Food and Drugs Act has been used as a model for the enforcement of other Federal statues.

"Dr. P. B. Dunbar, who will be Assistant Chief of the unit, entered the service of the Bureau of Chemistry in 1907 after receiving a Ph.D. degree from the Johns Hopkins University. He has since been engaged on work, either laboratory or administrative, in connection with the enforcement of the Food and Drugs Act. Since 1925 he has served as Assistant Chief of the Bureau of Chemistry in immediate charge of regulatory work. He assisted Mr. Campbell in the development of the project system for enforcing the Food and Drugs Act.

"Dr. J. K. Kaywood, Chairman of the Insecticide and Fungicide Board, will have immediate charge of the work involved in the enforcement of the Insecticide Act, in the new administrative unit, the Board being abolished by order of the Secretary of Agriculture.

"The Food, Drug and Insecticide Administration was created by an Act of Congress, upon the recommendation of the Secretary of Agriculture, for the purpose of separating the work involving scientific research from the work of Law enforcement. In the opinion of the Secretary it is highly desirable that the research work and the regulatory work be handled by separate administrative units because the growing pressure under which it is necessary to work in handling law enforcement is such as to interfere seriously with the attention that can be given to research work. Law enforcement must be handled promptly as cases arise and when both this work and the scientific work are conducted by the same organization the natural tendency is to put aside research which is not of immediate urgent appeal but which is of far reaching importance considering the long time future of American agriculture.

"The proposed segregation of the regulatory work into a Food, Drug and Insecticide Administration involves no change in the policy or methods of enforcing the Food and Drugs Act and other acts involved. These laws in the opinion of the Secretary of Agriculture are now being enforced in an efficient manner and the industries coming within the jurisdiction of the laws are now adjusted to existing plans and policies. Any material changes in the procedure for the enforcement of these regulatory statutes in the opinion of the Secretary would be disturbing to the industries affected with no compensating increase in the effectiveness of the law enforcement work. The laboratories of the present Bureau of Chemistry that are engaged on food and drug control work under the new plan will operate under the Food, Drug and Insecticide Administration and present policies and methods of enforcement will be continued."

PENNSYLVANIA DRUG STORE OWNERSHIP LAW ATTACKED BY LOUIS K. LIGGETT COMPANY.

Charging that an act of the last Legislature is unconstitutional and if enforced would drive all chain drug stores in the State out of business, Owen J. Roberts, on behalf of the Louis K. Liggett Company, asked for an injunction to stop enforcement of the act in an equity suit filed in the United States District Court at Philadelphia, June 4th.

A temporary injunction has been asked for. An appeal will be made for the assembling of a special court of three Judges, one a Circuit Judge and two Distruct Judges, in order to permit an appeal directly to the United States Supreme Court.

THE PENNSYLVANIA OWNERSHIP LAW.

The Pennsylvania Drug Store Ownership Law is a *supplement* to H. R. No. 1370—to the act approved May 17, 1917, it reads:

That every pharmacy or drug store shall be owned only by a licensed pharmacist, and no corporation, association or co-partnership shall own a pharmacy or drug store unless all the partners or members thereof are licensed pharmacists, except that any corporation organized and existing under the laws of the Commonwealth or of any other State of the United States and authorized to do business in the Commonwealth and empowered by its charter to own and conduct pharmacies or drug stores and any associations or co-partnership which at the time of the passage of this act still owns and conducts a registered pharmacy or pharmacies or a drug store or drug stores in the Commonwealth may continue to own and conduct the same, but no other or additional pharmacies or drug stores shall be established, owned or conducted by such corporation, association or co-partnership, unless all the members or partners thereof are registered pharmacists, but any such corporation, association or co-partnership which shall not continue to own at least one of the pharmacies or drug stores theretofore owned by it or ceases to be actively engaged in the conduct of a pharmacy shall be permitted thereafter to own a pharmacy or a drug store unless all of its partners or members are registered pharmacists, and except that any person not a licensed pharmacist who at the time of the passage of this act owns a pharmacy or a drug store in the Commonwealth may continue to own and conduct the same but shall not establish or own any additional pharmacy or drug store or if he or she ceases to operate such pharmacy or drug store shall not thereafter own a pharmacy or drug store unless he or she be a registered pharmacist, and except that the administrator, executor or trustee of the estate of any deceased owner of a registered pharmacy or drug store may continue to own and conduct such pharmacy or drug store during the period necessary for the settlement of the estate. Provided, That nothing in this section shall be construed to prevent or affect the ownership by other than a registered pharmacist of a store or stores wherein the sale or

manufacture of drugs or medicines is limited to proprietary medicines and commonly used household drugs. Provided such commonly used household drugs are offered for sale or sold in packages which have been put up ready for sale to consumers by pharmacists, manufacturing pharmacists, wholesale grocers, or wholesale druggists.

Section 2. Any person, co-partnership or corporation violating the provisions of this act shall be guilty of a misdemeanor and upon conviction thereof shall be sentenced to pay a fine of not more than one hundred dollars. Each day any such pharmacy is owned contrary to the provisions of this act shall be considered a separate offense.

PHARMACEUTICAL CONFERENCE PLEDGES FUND FOR DEFENSE.

Members of the New York Pharmaceutical Conference, Inc., to the number of 300, met May 2nd in Turn Verein Hall, New York City, and, after hearing several members speak on the charges of price fixing brought against the Conference by the Federal Trade Commission pledged a fund planned for defense of the charges.

Presentation of the case for the defense in the Commission's action against the Pharmaceutical Conference was begun before William Reeves, master, at the offices of the Commission in New York City, May 4th. Peter Diamond, *Chairman* of the Conference, who was the first witness, attributed to evasions of the prohibition law the plight of retail druggists from which the price-stabilizing plans of the organization had been designed to release them. He said that certain sellers of alcoholic liquors used the wholesale drug business as a cloak for their operations and sold drug-store goods at prices which demoralized the business of the legitimate trade. Mr. Diamond pointed out that the Pharmaceutical Conference had worked with the Federal authorities to put an end to the activities of the latter class.

LABELING OF MEDICINAL PREPARATIONS.

Bulletin No. 134, of the N. W. D. A., contains report No. 3 of the Committee on Quality of Medicinal Products—Eli Lilly, *Chairman*. It details the requirements and is full of useful information.

An important quotation from an opinion of the U. S. Supreme Court on the Food and Drugs Act follows:

"The statute is plain and direct. Its comprehensive terms condemn every statement, design and device which may mislead or deceive. Deception may result from the use of statements not technically false or which may be literally true. The aim of the statute is to prevent that resulting from indirection and ambiguity as well as from statements which are false. It is not difficult to choose statements, designs and devices which will not deceive. Those which are ambiguous and liable to mislead should be read favorably to the accomplishment of the purpose of the act."

A directory of State Officers charged with the enforcement of Foods, Drugs, Dairy Products and Feeding Stuffs Laws has been compiled by W. S. Frisbie, Chemist in Charge, office of Coöperation, Bureau of Chemistry, U. S. Deptartment of Agriculture. The directory contains the titles of the officers to whom letters of inquiry may be addressed regarding the subjects under their respective jurisdiction.

BOOK NOTICES AND REVIEWS.

A Textbook of Pharmaceutical Chemistry. By Arthur Owen Bently, Ph.C. and John Edmund Driver, M.Sc. (Lond.). Demy 8 vo. Pages xiv + 456, with 6 figures in the text. Oxford University Press, American Branch, New York. Price $6.00.

The authors have defined pharmaceutical chemistry as "that branch of applied chemistry which treats of the chemical substances used in medicine, their preparation, properties and identification, and the methods employed in determining their purity."

The definition has been religiously adhered to with respect to the compounds and preparations treated, but the number of compounds selected for treatment has been greatly restricted. For instance, no mention is made of such important compounds as the arsenobenzenes, the acriflavine dyes, the organomercury compounds, the silver-proteins, the digestive ferments, methylene blue, etc.

Another feature of the book which strikes one as being inadequate is the descriptions of methods of preparation. In most of the

cases the descriptions are couched in general terms; only in certain cases are the quantities given with specific directions for preparation.

It is stated in the preface that the book was written to meet the needs of those studying for the diplomas of the Pharmaceutical Society of Great Britain and for degrees in pharmacy and that it covers the chemistry necessary for the Druggist Qualifying Examination. No doubt it serves these purposes, but it is believed that there will be only a very limited demand for it in this country as it is too restricted in scope to serve as a reference work and it adheres too closely to the British Pharmacopœia to serve as a text in our schools and colleges of pharmacy. A. G. DuMez.

Chemistry of the Proteins and Its Economic Applications. By Dorothy Jordan Lloyd, M.A. (Cantab), D.Sc. (Lond.) and Sir Frederick Howland Hopkins, M.B., D.Sc. Pages xii + 279 with 50 illustrations. Price $3.00. P. Blakiston's Son & Co., Philadelphia.

In this small volume there is given a general review of the entire field of protein chemistry and it is done in a most satisfactory manner. The theories of protein chemistry are concisely stated, and the practical applications to biology and industry are brought out in every instance where they apply.

The book is divided into two parts. The first part deals with the constitutional chemistry of the proteins and the second part with their physical chemistry.

While the book is of special interest to students and research workers in the biological sciences, it contains much of interest and value to pharmacists. There are chapters on the chemistry of protein foods with special reference to dietetics, the problems of food preservation, the theory of protein solutions and the industrial applications of proteins, use of which give information applicable to pharmacy. A. G. DuMez.

Recent Advances in Biochemistry. By John Dryde, B.Sc. (St. And.), M.Sc., (Wales). Pages vii + 348 with 38 illustrations. P. Blakiston's Son & Co., Philadelphia.

In this volume an attempt has been made to review the recent advances in the field of biochemistry where these advances have been most striking. The topics included evidently have been selected with a view to wide diversification, hence anyone interested in the biological or medical sciences will find the volume attractive reading.

Of special interest to the pharmacist are the chapters on the carbohydrates, the vitamins, the chemical bases of specific immunological reactions and chemotherapy.

The prescription pharmacist can well afford to reserve a place for this volume on his bookshelf. A. G. DuMez.

PLANT SCIENCE SEMINAR.

Fifth Annual Session of Plant Science Seminar will probably be held in St. Louis, during the week, commencing August 15 or August 29, 1927; definite date will be announced in next issue of the JOURNAL.

If you have attended previous sessions, you know how enjoyable they are, if you have not, do so this time and be assured of a hearty welcome. If you wish to make any suggestions, read a paper or want any information, you are invited to communicate with O. P. M. Canis, *Secretary-Treasurer*, Professor of Pharmacognosy, Rutgers University, Department of Pharmacy, Newark, N. J., or E. N. Gathercoal, *President*, Professor of Pharmacognosy, University of Illinois School of Pharmacy, Chicago, Ill.

TENTATIVE PROGRAM.

Special addresses by Dr. H. Thoms, Pharmaceutical Institute, Berlin, Germany; Prof. E. Fullerton Cook, Philadelphia College of Pharmacy; Dean W. B. Day, University of Illinois School of Pharmacy.

Laboratory demonstrations: "Quantitative Evaluation of Organic Powders," Dr. G. L. Keenan; "Survey of Our Native Drug Resources," Dr. W. W. Stockberger; "Report on Histological Nomenclature," Professors E. L. Newcomb, A. Schneider, H. W. Youngken, E. H. Wirth, E. N. Gathercoal.

New German Pharmacopœia compared with U. S. P. X, Prof. E. H. Wirth.

"Pharmacology and Plant Physiology," Professor A. H. Clark, Dr. H. C. McGuigan, Dr. E. H. Vollweiler.

Round Table on teaching of Pharmacognosy led by Dr. A. Hogstad. *Botanical Excursions*, led by Dr. H. H. Rusby, Dr. A. Viehoever and Dean Day.

Prof. Charles Plitt, Baltimore, and Dr. La Garde, bio-chemist of Prague, will present papers.